JOINT-BIDDING

SPECIFICATIONS

AND

SKETCHES

FOR

MANHATTAN

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GENERAL PROVISIONS
FOR PRIVATE UTILITY FACILITIES

1. This document contains the current list of standard JB specifications and J.B. Sketches issued by the private utility companies to support, protect, maintain, adjust, remove, and replace private utility facilities during the performance of City of New York sponsored contracts to re-develop Lower Manhattan. These specifications and sketches are to be used in conjunction with City of New York contracts that contain "JB" items. These specifications and sketches provide descriptions of the JB items that have been included in JB Sections.

2. The facility operator(s) shall provide to the Contractor, where specified, all specialized materials necessary to accomplish the work specified in the following "JB" sections. The Contractor shall notify the facility operator(s) of the installation schedule at least five (5) days before such materials are required on the site.

3. All materials supplied by the facility operator(s) shall be delivered F.O.B. to the Contractor's requested location. It shall then be the Contractor's responsibility and expense to unload, handle, store, deliver and/or distribute the material supplied by the facility operator(s) to the required job location(s) for the contract. It shall also be the Contractor's responsibility to inspect and verify upon delivery that the correct quantity of material has been delivered and advise the facility operator(s), through its authorized representative, of all damaged material. Any material which is damaged or lost after the Contractor's inspection and acceptance, shall be replaced by the Contractor at no additional expense to the facility operator(s).

4. Unless otherwise specified, all work shall be performed in conformance with the applicable Highway, Sewer and Water Main Specifications.

5. All Maintenance and Protection of Traffic requirements on Joint Bid projects performed on behalf of the Utilities shall be funded solely with applicable contract bid items only. All references made regarding the Maintenance and Protection of Traffic that are contained in the various Joint Bid Specifications "Price to Cover" section, are amended and shall read " all Maintenance and Protection of Traffic requirements shall be paid utilizing applicable contract bid items only".

6. The contractor will provide each Utility with a copy of the contract safety plan on or before the date of the City's notice to proceed, but not later than ten (10) business days after the notice to proceed.

JB 100 - 116 - TRENCH CROSSINGS SUPPORT AND PROTECTION OF UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to support and maintain and protect and accommodate the integrity of utility facilities, including but not limited to:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes; Steam Facilities:
5. Oil-o-Static Facilities; and
6. Non-Cost Sharing Gas;

of various sizes and configurations, crossing at various angles as shown on the Contract Documents above the sewer, catch basin chute connection pipes, water main trench excavation at the locations shown in the contract documents or as encountered during construction and as directed by the facility operator in consultation with the Resident Engineer. The support, maintenance, protection, and accommodation of utility facilities encountered during performance of test pits as ordered by the City are also covered under this item.

The above reference to facilities crossing at "various angles" shall mean that such facilities are crossing sewer, water main and catch basin chute excavations at a 90 degree angle to the proposed sheeting line or side of excavation (for unsheeted trenches) with an allowable deviation of 60 degrees in any direction. The only exceptions to this definition shall be where greater angles are shown on the contract documents.

B. Materials

All materials used to support and protect shall be as indicated on the attached standard Sketches JB 100 A, A-1, B, C, C-1 and D shall be supplied by the Contractor and approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall support and protect all utility facilities crossing excavations as shown on the Standard sketches. Sketches JB 100A and JB 100A-1 are to be used as a guide. Alternate methods and/or one or a combination of methods shown on the JB sketches shall be permitted if proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer. It is the intent of this item to support and maintain and protect and accommodate the integrity of utility facilities and all combinations and configurations of utility facilities encountered in the course of the work. Support Requirements for utility facilities crossing Items (Sketch JB 100A) are intended to support the actual square foot cross section area of the utility facilities. Where multiple facilities are

measured for payment purposes as one facility, conditions may require that each facility be supported separately. Sketch JB 100A can be used as a guide to determine support requirements.

The facility operator shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and to ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation and/or sheeting operations. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator in consultation with the Resident Engineer, to determine relationships and/or dimensions, the contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, with a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility crossing or interference.

Combination of hand and hand and machine excavation may be required within the limits of the city trench under and between zones of protection and/or between utility facilities and other existing structures.

D. Method of Measurement

The quantity to be measured for payment shall be each (EA) type of utility facility crossing any new sewer, catch basin chute connection pipe or water pipe trench excavation. The various types of facility crossings (described below) shall be defined as "ranges" of their cross sectional areas, measured in square feet (SF) along a plane cutting through the trench parallel to the water/sewer and catch basin chute connection pipe trench. The area shall be a rectangle or square vertical plane enclosing and touching the outside limits of the utility. The sides of the rectangle or square shall be approximately level and plumb as shown on attached Sketch JB 100 E. When utility facilities are located and overlap at any point along the utility spans crossing the trench excavation and are over, or under and within one foot of each other, both horizontally and vertically, (except oil-o-static lines which shall be within two feet of each other), the utility facilities involved shall be considered, for the purposes of this section, as one utility crossing limited by the outside faces of the extreme pipes, conduits, ducts, and/or duct banks. The cross sectional area to be measured shall be selected at the point of the greatest area along the utility spanning the trench excavation, as previously described, and as shown on the attached Sketch JB 100 E. Each type of utility crossing shall be paid for separately. The types of utility crossings are defined as follows:

Type .1 = Cross sectional area of utility up to and including 0.75 SF
Type .2 = Cross sectional area of utility over 0.75 SF, up to and including 2.0 SF
Type .3 = Cross sectional area of utility over 2.0 SF, up to and including 6.0 SF
Type .4 = Cross sectional area of utility over 6.0 SF, up to and including 10.0 SF
Type .5 = Cross sectional area of utility over 10.0 SF, up to and including 15.0 SF
Type .6 = Cross sectional area of utility over 15.0 SF, up and including 20.0 SF
Type .7 = Cross sectional area of utility over 20.0 SF

E. Price to Cover

The unit price bid for each of the various items shall cover the cost of all labor, material, equipment, insurance, and incidentals necessary to completely support and maintain and protect and accommodate the integrity of the utilities without disruption of service to the customers and in accordance with contract documents. The unit price shall also include the cost of: supports, slings and beams installed for utility support; additional supports necessary for multiple facilities that for payment purposes are measured as one facility; changes of sheeting method and configuration where necessary to accommodate the utility; installation of new sewer, water, and catch basin chute connection pipes under the utilities (including the removal of any abandoned existing facilities to be removed under the City Contract as shown on the Contract Drawings); a combination of hand and hand and machine excavation within the zone of protection, backfilling and compacting around, over, under and between the zones of protection of the utilities; and removal of sheeting around the utilities, and the cost of any impact with maintenance and protection of traffic. The unit price shall also cover any additional excavations, including hand and hand and machine excavations under and in between zones of protection for single and multiple utilities; tunneling; additional pipe cutting and joining; removal of existing city facilities; snaking and/or in between utility facilities and other existing structures.

F. References

1. Sketches JB 100A, A-1, B, C, C-1, D
2. NYS Industrial Code Rule 753
3. Sketch JB 100E

JB 200 -EXTRA DEPTH EXCAVATION OF CATCH BASIN CHUTE CONNECTION PIPES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance, and incidentals required to install catch basin chute connection pipes, at a depth greater than specified in order to accommodate the integrity of utility facilities. These facilities of various sizes and configurations will cross the catch basin chute connection at various angles as shown on the Contract Documents. The support and maintenance and protection and accommodation of facilities encountered during the performance of this item shall be paid under other JB items. This item includes the additional excavation, material and effort(s), above and beyond the theoretical alignment for the installation of catch basin chute connection pipes, caused by interference with utility facilities.

B. Material – N/A

C. Methods of Construction

Upon supporting and maintaining and protecting and accommodating the affected utilities sufficiently at the sole discretion of the facility operator(s) in consultation with the Resident Engineer as deemed included under other JB items, the contractor shall be permitted to proceed with a combination hand and machine excavation, as appropriate, within and below a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility crossing or interference. Combination of hand and hand and machine excavation may be required within the limits of the City trench under and in between the zones of protection and/or between utility facilities and other existing structures.

D. Method of Measurement

The measurement for payment shall be the linear footage (L.F.) of catch basin chute connection pipe, actually installed at a depth greater than specified. This shall be at an upstream invert depth lower than four (4) feet for Type I and Type II Catch Basins and four feet six inches (4'-6") for Type III Catch Basins from the proposed pavement grade because of interference from private utility facilities as shown on Sketches JB 200 A and B measured from the inside face of the catch basin to the inside face of the manhole, along the center line of the catch basin chute connection pipe, at locations where the catch basin sewer chute connection pipes are installed. Utility facility owners will jointly determine the percentage of ownership when two or more facilities with different owners cause the extra depth.

E. Price to Cover

The unit price bid per linear foot shall cover the cost of all additional labor, material, equipment, insurance, and incidentals necessary to install catch basin chute connections, at a depth greater than specified in order to accommodate the integrity of the utility facilities without disruption of service to the customers. The unit price shall further include the additional cost of sheeting; changes of sheeting method and configuration to accommodate the utilities; installation and snaking of catch basin chute pipes under the utilities; all additional hand and machine excavations, backfilling and compacting around, over, under and between the zone of

protection for single and multiple utility facilities and/or in between utility facilities and other existing structures of the utilities; tunneling; removal of sheeting around the utilities; and the cost of any impact with maintenance and protection of traffic. The unit price shall also cover the cost of coring out the new POE (point of entry); modifying the existing POE; sealing the existing abandoned POE opening; and all other additional items necessary to perform all work incidental thereto; including widening of the trenches to facilitate the above work; subsequent additional backfill; additional sheeting and/or changing sheeting method to accommodate chute connection pipe and utility crossings; and installing traffic plates that may be required to temporarily close and/or complete the work.

F. References

1. Sketches JB 200A and 200B

JB 225 - REMOVAL AND INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment, insurance and incidentals required to support and/or protect the integrity of utility facilities required during the excavation, removal of existing catch basins and installation of new pre-cast and/or field constructed catch basins within maximum excavation limits shown on Sketch No. JB 225. This shall include but not be limited to the following types of utility facilities:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Oil-o-Static Facilities;
6. Non Cost Sharing Gas; and

encroaching catch basin excavation and sheeting lines as described further in this section and attached sketch JB 225. This item also includes the use of controlled low strength material backfill adjacent to catch basins within the maximum excavation limits shown on Sketch No. JB 225, in accordance with Specification under Addendum #1, Section 7.18 CM (Controlled Low Strength Material). All backfill within the maximum excavation limits shown in Sketch No. JB 225 shall be of controlled low strength material (CLSM) in compliance with requirements of Section 7.18 CM, and its cost shall be deemed included in this item.

B. Materials

Furnish Controlled Low Strength Material fill or backfill as required and specified in Addendum #1, Section 7.18 CM (Controlled Low Strength Material). All materials used to support and protect utility facilities shall be as indicated on standard Sketches JB 100 A, A-1, B, C, C-1 and D, contained elsewhere in this contract, shall be supplied by the Contractor and approved by the facility operator(s) in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall use sheeting methods that permit maintenance and support and protection of all utility facilities covered by this section. It is the intent of this item to support and maintain and protect any and all combinations and configurations of utility facilities located within limits indicated on Sketch No. JB 225. For the construction of Type III pre-cast and/or field constructed basins, the spillway shall be constructed in a separate stage where the excavation limits may be waived after the basin structure has been installed and backfilled. Excavation for the spillway shall not exceed 3' beyond the exterior finished surface of the proposed spillway. Excavation method for spillway construction shall be done by hand. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) are not covered by this section and shall be removed or adjusted by the Contractor under other JB items within this contract or by facility operator at their own expense. This section shall then cover the adjusted facilities.
Utility facilities located beyond the established maximum excavation limits are not affected by work specified and shall not be disturbed during any type of pre-cast and/or field constructed catch basin installation and/or removal. Contractor shall be solely and totally responsible for disturbances and/or any damages to such facilities. The facility operator(s) shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As

provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and to ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator(s) in consultation with the Resident Engineer, to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, within a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility interference.

D. Method of Measurement

The quantity to be measured for payment shall be each location where an existing catch basin is removed and a new pre-cast and/or field constructed basin is installed in the same location and where utility facilities are located within the limits indicated on Sketch No. JB 225. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) shall be removed or adjusted by the contractor under other JB items within this contract. This section shall then cover the adjusted facilities. Payment will be made only one time at locations where an existing catch basin is removed and a new pre-cast and/or field constructed basin is installed at the same location as an existing basin, as specified on contract drawings.

E. Price to Cover

The unit price bid for each installation and removal of catch basins with utility interferences shall cover the incremental cost of all labor, material, equipment, insurance and incidentals necessary to completely support and protect and maintain the integrity of the utilities without disruption of service to the customers and in accordance with other types of utility items. The unit price shall also include the cost of: supports, slings and beams installed for utility support; changes of sheeting method and configuration where necessary to accommodate the utility; a combination of hand and machine excavation within the excavation limits specified; the disposal of excess backfill material; the placing of backfill material and/or controlled low strength material backfill adjacent to catch basins within the maximum excavation limits shown on Sketch JB 225; backfilling and compacting around over, under and in between utility facilities; installation and removal of sheeting around facilities; support and protection of utility facilities encountered during construction of the spillway; and the cost of any impact with maintenance and protection of traffic. The unit price shall also cover any additional excavations including hand and hand and machine excavations under and in between single and multiple facilities; and/or in between utility facilities and other existing structures. The unit price shall be deemed to cover all incremental cost for all labor, material, equipment, and incidentals necessary to excavate, remove existing catch basin and install a new pre-cast and/or field constructed basin while completely supporting, protecting, maintaining and/or adjusting the catch basin to accommodate the integrity of the encroaching utility facilities without disruption of service to the customers in accordance with the contract documents. The unit price shall also cover all additional restricted excavating, sheeting, backfilling, and compaction around, over, under, and between utility facilities and all other existing structures and/or newly installed and/or removed catch basin.

F. References

1. Sketch JB 225
2. Addendum #1, Section 7.18 CM – Controlled Low Strength Material
3. Sketches JB 100-A, A-1, B, C, C-1 and D
4. NYS Industrial Code Rule 753

JB 226 - INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment, insurance and incidentals required to support and/or protect the integrity of utility facilities required during the excavation and installation of pre-cast and/or field constructed catch basins, where no basin previously existed, within maximum excavation limits shown on Sketch No. JB 225. This shall include but not be limited to the following types of utility facilities:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Oil-o-Static Facilities;
6. Non Cost Sharing Gas; and

encroaching catch basin excavation and sheeting lines as described further in this section and attached sketch JB 225. This item also includes the use of controlled low strength material backfill adjacent to catch basins within the maximum excavation limits shown on Sketch No. JB 225, in accordance with Specification under Addendum #1, Section 7.18 CM (Controlled Low Strength Material). All backfill within the maximum excavation limits shown in Sketch No. JB 225 shall be controlled low strength material backfill in compliance with Specification under Addendum #1, Section 7.18 CM (Controlled Low Strength Material), and its cost shall be deemed included in this item.

B. Materials

Furnish controlled low strength material fill or backfill as required and specified in Specification under Addendum #1, Section 7.18 CM (Controlled Low Strength Material). All materials used to support and protect utility facilities shall be as indicated on standard Sketches JB 100 A, A-1, B, C, C-1 and D, contained elsewhere in this contract, shall be supplied by the Contractor and approved by the facility operator(s) in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall use sheeting methods that permit maintenance and support and protection of all utility facilities covered by this section. It is the intent of this item to support and maintain and protect any and all combinations and configurations of utility facilities located within limits indicated on Sketch No. JB 225. For the construction of Type III pre-cast and/or field constructed basins, the spillway shall be constructed in a separate stage where the excavation limits may be waived after the basin structure has been installed and backfilled. Excavation for the spillway shall not exceed 3' beyond the exterior finished surface of the proposed spillway. Excavation method for spillway construction shall be done by hand. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) are not covered by this section and shall be removed or adjusted by the Contractor under other JB items within this contract or by facility operator at their own expense. This section shall then cover the adjusted facilities.

Utility facilities located beyond the established maximum excavation limits are not affected by work specified and shall not be disturbed during any type of catch basin installation. Contractor shall be solely and totally responsible for disturbances and/or any damages to such facilities. The facility operator(s) shall identify the locations of all utilities within the contract area as required by

New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and to ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator(s) in consultation with the Resident Engineer, to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, within a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility interference.

D. Method of Measurement

The quantity to be measured for payment shall be the number of basins installed where utility facilities are located within the limits indicated on JB Sketch No. JB 225. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) shall be removed or adjusted by the contractor under other JB items within this contract. This section shall then cover the adjusted facilities. Payment will be made only one time at locations where a new pre-cast and/or field constructed basin is installed, and no catch basin previously existed, as specified on contract drawings.

E. Price to Cover

The unit price bid for each installation of catch basins with utility interferences shall cover the incremental cost of all labor, material, equipment, insurance and incidentals necessary to completely support and protect and maintain the integrity of the utilities without disruption of service to the customers and in accordance with other types of utility items. The price shall also include the cost of: supports, slings and beams installed for utility support; changes of sheeting method and configuration where necessary to accommodate the utility; a combination of hand and machine excavation within the excavation limits specified; the disposal of excess backfill material; the placing of backfill material and/or controlled low strength material backfill adjacent to catch basins within the maximum excavation limits shown on Sketch JB 225; backfilling and compacting around over, under and in between utility facilities; installation and removal of sheeting around facilities; support and protection of utility facilities encountered during construction of the spillway; and the cost of any impact with maintenance and protection of traffic. The price shall also cover any additional excavations including hand and hand and machine excavations under and in between single and multiple facilities; and/or in between utility facilities and other existing structures. The unit price shall be deemed to cover all incremental cost for all labor, material, equipment, and incidentals necessary to excavate and install specified pre-cast and/or field constructed catch basins, where no catch basin previously existed, while completely supporting, protecting, maintaining and/or adjusting the catch basin to accommodate the integrity of the encroaching utility facilities without disruption of service to the customers in accordance with the contract documents. The price shall also cover all additional restricted excavating, sheeting, backfilling, and compaction around, over, under, and between utility facilities and all other existing structures and/or newly installed catch basin.

F. References

1. Sketch JB 225
2. Addendum #1, Section 7.18 CM (Controlled Low Strength Material)
3. Sketches JB 100-A, A-1, B, C, C-1 and D
4. NYS Industrial Code Rule 753

JB 227 - REMOVAL OF CATCH BASINS WITH UTILITY INTERFERENCES

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment, insurance and incidentals required to support and protect the integrity of utility facilities required during the excavation and removal or abandoning in place in lieu of removal, if directed by the Resident Engineer, of catch basins within maximum excavation limits shown on Sketch No. JB 225. This shall include but not be limited to the following types of utility facilities:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Oil-o-Static Facilities;
6. Non Cost Sharing Gas; and

encroaching catch basin excavation and sheeting lines as described further in this section and attached sketch JB 225.

B. Materials

All materials used to support and protect utility facilities shall be as indicated on standard Sketches JB 100 A, A-1, B, C, C-1 and D, contained elsewhere in this contract, shall be supplied by the Contractor and approved by the facility operator(s) in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall use sheeting methods that permit maintenance and support and protection of all utility facilities covered by this section. It is the intent of this item to support and maintain and protect any and all combinations and configurations of utility facilities located within limits indicated on Sketch No. JB 225. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) are not covered by this section and shall be removed or adjusted by the Contractor under other JB items within this contract or by facility operator at their own expense. This section shall then cover the adjusted facilities.

Utility facilities located beyond the established maximum excavation limits are not affected by work specified and shall not be disturbed during any type of catch basin removal or abandoning. Contractor shall be solely and totally responsible for disturbances and/or any damages to such facilities. The facility operator(s) shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and to ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator(s) in consultation with the Resident Engineer, to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, within a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility interference.

D. Method of Measurement

The quantity to be measured for payment shall be each basin removed or abandoned in place in lieu of removal, if directed by the Resident Engineer, where utility facilities are located within the limits indicated on JB Sketch No. JB 225. Utility facilities located closer than the established minimum limits (as shown on Sketch JB 225) shall be removed or adjusted by the contractor under other JB items within this contract. This section shall then cover the adjusted facilities. Payment will be made only one time at locations where an existing catch basin is to be removed or abandoned in place in lieu of removal, if directed by the Resident Engineer, and no new basin is to be installed at the same location, as specified on contract drawings.

E. Price to Cover

The unit price bid per each removal or abandoning in place in lieu of removal of catch basin with utility interferences shall cover the incremental cost of all labor, material, equipment, insurance and incidentals necessary to completely support and protect and maintain the integrity of the utilities without disruption of service to the customers and in accordance with other types of utility items. The unit price shall also include the cost of: supports, slings and beams installed for utility support; changes of sheeting method and configuration where necessary to accommodate the utility; a combination of hand and machine excavation within the excavation limits specified; the disposal of excess backfill material; the placing of backfill material, backfilling and compacting around over, under and in between utility facilities; installation and removal of sheeting around facilities; support and protection of utility facilities, and the cost of any impact with maintenance and protection of traffic. The unit price shall also cover any additional excavations including hand and hand and machine excavations under and in between single and multiple facilities; and/or in between utility facilities and other existing structures. The unit price shall be deemed to cover all incremental cost for all labor, material, equipment, and incidentals necessary to excavate and remove or abandon in place in lieu of removal, if directed by the Resident Engineer, of specified catch basins, where no new catch basin is to be installed at the same location, while completely supporting, protecting, maintaining the encroaching utility facilities without disruption of service to the customers in accordance with the contract documents. The price shall also cover all additional restricted excavating, sheeting, backfilling, and compaction around, over, under, and between utility facilities and all other existing structures following the removal or abandoning in place in lieu of removal, if directed by the Resident Engineer, of catch basin.

F. References

1. Sketch JB 225
2. Sketches JB 100-A, A-1, B, C, C-1 and D
3. NYS Industrial Code Rule 753

JB 300 - SPECIAL CARE EXCAVATION AND BACKFILLING

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment, insurance and incidentals required for trench excavation when protecting and maintaining and accommodating the integrity of utility facilities, including but not limited to:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Non Oil-O-Static Steel Pipes; Steam Facilities and
5. Non Cost Sharing Gas;

of various sizes and configurations, encroaching (partially exposed) or paralleling (not exposed) within 6" of the approved City trench lines for all phases of contract excavation as shown on contract drawings or as encountered during construction, except excavations to the ultimate depth for curbs, sidewalks and roadway/base/sub-base removal which are covered under specific JB items. This item shall also apply for facilities that cross excavations for water service installation and extensions or excavations for water tap searches. The contract items specified under this section shall not be measured for payment in conjunction with any other types of utility items. All work shall be performed in accordance with the contract plans, specifications, the attached Sketch # JB 300 A and at the directions of the facility operator in consultation with the Resident Engineer.

B. Materials – N/A

C. Method of Construction

The Contractor shall maintain and protect and accommodate the integrity of all utility facilities encroaching/paralleling within excavations as schematically shown on the attached Sketches # JB 300 A. The facility operator(s) shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator(s) in consultation with the Resident Engineer to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, within a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each utility encroaching.

D. Method of Measurement

The unit price for this work item shall be based on the volume of cubic yard (CY) of special care excavation calculated as follows:

- For paralleling facilities (not exposed): Depth shall be measured from the bottom of the existing roadway base to 5'-0" below existing street surface grade or bottom of trench, whichever is less. The width shall be measured as 1 foot from the face of excavation toward the center of excavation. The length shall be measured as the length of the parallel facility. (See sketch JB 300 A.)

- For encroaching facilities; Depth as defined above multiplied by the width of encroachment (pipe partially or fully exposed) plus 1 foot, multiplied by the length of facility encroachment. (see Sketch JB 300 A.)

- For facilities crossing water service excavations; Depth as defined above multiplied by the width taken as the outside diameter of or width of structure plus one foot on either side (2 feet) multiplied by the length of the exposed facility crossing the trench.

The volume calculation shall in all cases include, the volume occupied by the utility proper within the payment area described above. Overlapping volume dimensions measured as described above may occur when multiple utilities are encroaching trench excavations. In such cases, all such utilities shall be counted as one utility limited by the maximum encroachment of pipes, conduit(s), and conduit banks faces. The volume shall then be calculated as described above and shown on attached Sketch # JB 300 A. Utilities identified as abandoned by the facility operator prior to be beginning of excavation, are not included for payment under this item.

E. Price to Cover

The unit price bid per cubic yard for special care excavation and backfill shall cover the incremental cost of all labor, material, equipment, insurance and incidentals necessary to completely protect and maintain and accommodate the integrity of the facilities without disruption of service to the customers and in accordance with contract documents. The unit price shall also include the cost of: difficulties encountered during the performance of contract work items under, over and around the facilities, loss of productivity due to slower rate of excavation (special care) during excavation, including water tap search excavations and the use of such methods as hand excavation around existing single and multiple facilities; backfilling and compaction around, over and under the utilities including the use of special methods; removal of sheeting from around the facilities; and traffic plates that may be required to temporarily close and/or complete the work.

F. References

1. Sketch JB 300A
2. NYS Industrial Code Rule 753

JB 301 - SPECIAL CARE EXCAVATION AND BACKFILLING FOR OIL-O-STATIC PIPES

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment, insurance and incidentals required for trench excavation when maintaining, protecting, and accommodating the integrity of the facility operator's oil-o-static pipe(s). This system consists of steel pipes containing the high tension cables and cooling oil (oil-o-static pipes) encroaching (partially exposed) or paralleling (not exposed) within 12 inches of the face of the approved city excavations for all phases of contract excavation as encountered during construction, except excavations to the ultimate depth for curbs, sidewalks and roadway/base/subbase which are covered under specific contract items. The work shall be performed in accordance with the contract plans, specifications, attached Sketch JB 301 A and at the directions of the facility operator in consultation with the Resident Engineer.

B. Materials

Backfill material to be used around oil-o-static pipes will be paid for under Item JB-303.

C. Method of Construction

The Contractor shall maintain, protect and accommodate the integrity of oil-o-static pipes encroaching/paralleling excavations as schematically shown on attached Sketch JB 301 A. The facility operator shall identify the locations of oil-o-static pipe(s) within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the oil-o-static pipe(s) and ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected oil-o-static pipe(s) sufficiently at the sole discretion of the facility operator in consultation with the Resident Engineer to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with hand excavation only, within a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of each oil-o-static encroaching/paralleling.

D. Method of Measurement

The unit price for this work shall be based on the volume of cubic yard (C.Y.) of special care excavation calculated as follows:

- For paralleling (not exposed) oil-o-static pipe(s) within 12 inches of the outside edge of the approved City trench line, the volume included for payment shall be calculated as the depth from below the existing pavement base to the bottom of the unsheeted trench excavation or to the bottom of the oil-o-static pipe whichever is greater, multiplied by the width, measured as one foot from the face of the excavation toward the center of excavation, multiplied by the length of the parallel oil-o-static line. See Sketch JB 301 A.

- For encroaching (exposed) oil-o-static pipe(s) the volume shall be calculated as the width of the encroachment (facility partially or fully exposed in the trench) plus one foot, multiplied by length of the encroachment, multiplied by the depth as defined above. (See Sketch JB 301 A).

The volume calculation shall in all cases include, the volume occupied by the utility proper within the payment area described above. Overlapping volume dimensions measured as described above may occur when multiple utilities are encroaching trench excavations. In such cases, all such utilities shall be counted as one utility limited by the maximum encroachment of pipes, conduit(s), and conduit banks faces. The volume shall then be calculated as described above and shown on attached Sketch # JB 301A. Utilities identified as abandoned by the facility operator prior to be beginning of excavation, are not included for payment under this item.

E. Price to Cover

The unit price bid per cubic yard of special care excavation and backfill of oil-o-static pipes shall cover the incremental cost of all incremental labor, material, equipment, insurance and incidentals necessary to completely protect, and maintain, and accommodate the integrity of oil-o-static pipe(s) without disruption of service to the customers and in accordance with contract documents. The unit price shall also include the cost of: difficulties encountered during the performance of contract work items under, over and around the oil-o-statics; installation and removal of sheeting; loss of productivity due to slower rate of excavation (special care) during excavation, including the use of such methods as hand excavation around existing oil-o-static pipe(s); trucking and disposing of unsuitable fill; backfilling and compaction, in compliance with DOT requirements, around, over and under the facilities including the use of special methods; and traffic plates that may be required to temporarily close and/or complete the work.

F. References

1. Sketch JB-301A
2. Item JB-303
3. NYS Industrial Code Rule 753

JB 303 - FURNISH, DELIVER AND INSTALL TYPE 3/8 CLEAN SAND BACKFILL

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to furnish, deliver and install Type 3/8 clean sand backfill for use around utility facilities at various locations within the contract limits as directed by the facility operator in consultation with the Resident Engineer.

B. Materials

The Contractor shall supply Type 3/8 clean sand backfill. Type 3/8 clean sand backfill shall have a pH value greater than 5.5 and shall be free of cinders, ashes, vegetable matter, rubbish or any foreign matter. The sand must conform to the following sieve analysis.

Sieve Size	Percent Passing
3/8 inch	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	10-30
#200	0

C. Method of Construction

The Contractor shall furnish, deliver and install Type 3/8 clean sand for use as backfill material around utility facilities. The amount of Type 3/8 clean sand backfill material shall extend one foot under, around, and over the facilities or as directed by the facility operator in consultation with the Resident Engineer.

D. Method of Measurement

The quantity to be measured for payment shall the actual number of cubic yards (CY) of Type 3/8 clean sand backfill in place after compaction as ordered by the facility operator. The amount measured for payment is not to exceed the limits of one foot under, around, and over the facilities unless approved by the facility operator in consultation with the Resident Engineer.

E. Price to Cover

The unit price bid per cubic yard to furnish, deliver and install 3/8 clean sand backfill shall cover the cost of all labor, materials, equipment, insurance and incidentals necessary to furnish, deliver and install Type 3/8 clean sand backfill for use around utility facilities. The unit price shall also include the incremental cost for all labor, material, equipment, insurance and incidentals necessary and required to place, compact, sample and test the backfill material.

JB 330E - SUPPORT AND PROTECTION OF ELECTRIC AND GAS FACILITIES DURING EXCAVATION OF CITY TRENCH WHEN FACILITIES LIE WITHIN TRENCH LIMITS

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to support and maintain and protect and accommodate the integrity of electric and non-cost sharing gas utility facilities when facilities lie completely within the trench limits, including but not limited to:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Oil-o-Static Facilities; and
6. Non-Cost Sharing Gas;

of various sizes and configurations, as shown on the contract documents or as encountered during construction. In consultation with the Resident Engineer, the facility operator through its authorized representatives shall be solely responsible for the approval of methods used by the contractor to support and protect utility facilities. All work shall be performed without risking the integrity of the utility facility and be done consistent with all applicable safety standards as directed by the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to support and protect shall be as indicated on the attached standard Sketches JB 100 A, A-1, B, C, C-1,D and E shall be supplied by the Contractor and approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall support and protect all electric and gas utility facilities which lie completely within the trench limits as shown on the Standard sketches. Sketches JB 100A and JB 100A-1 are to be used as a guide in determining the appropriate support and protection requirements. Alternate methods and/or one or a combination of methods shown on the JB sketches shall be permitted if proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer. It is the intent of this item to support and maintain and protect and accommodate the integrity of electric and gas utility facilities and all combinations and configurations of the utility facilities encountered in the course of the work. Support Requirements for electric and gas utility facilities which lie completely within the trench limits (Sketch JB 100A) are intended to support the actual square foot cross section area of the utility facilities. Where multiple facilities are measured for payment purposes as one facility, conditions may require that each facility be supported separately. Sketch JB 100A should be used as a guide to determine support requirements.

The facility operator shall identify the locations of all electric and gas utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the facilities and to ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation and/or sheeting operations. Upon exposing the affected utilities sufficiently at the sole discretion of the facility operator in consultation with the Resident Engineer, to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, with a zone of protection whose limit shall be defined as a perimeter located 12 inches from the outside face of the electric and gas utility facility that lie completely within the trench limits.

Combination of hand and hand and machine excavation may be required within the limits of the City trench under and between zones of protection and/or between utility facilities and other existing structures.

D. Method of Measurement

The quantity to be measured for payment shall be Linear Foot (L.F.) of electric and gas utility facility actually excavated and supported and protected. The various types of utility facilities encountered (described below) shall be defined as "ranges" of their cross sectional areas, measured in square feet (SF) along a plane cutting through the City trench parallel. The area shall be a rectangle or square vertical plane enclosing and touching the outside limits of the utility. The sides of the rectangle or square shall be approximately level and plumb as shown on attached Sketch JB 100 E. When electric and gas utility facilities are located and overlap at any point along the utility spans crossing the trench excavation and are over, or under and within one foot of each other, both horizontally and vertically, (except oil-o-static lines which shall be within two feet of each other), the utility facilities involved shall be considered, for the purposes of this section, as one utility facility limited by the outside faces of the extreme pipes, conduits, ducts, and/or duct banks. The cross sectional area to be measured shall be selected at the point of the greatest area along the utility spanning the trench excavation, as previously described, and as shown on the attached Sketch JB 100 E. Each type of utility facility encountered shall be paid for separately. The types of electric and gas utility facilities are defined as follows:

Type .1 = Cross sectional area of utility up to and including 0.75 SF
Type .2 = Cross sectional area of utility over 0.75 SF, up to and including 2.0 SF
Type .3 = Cross sectional area of utility over 2.0 SF, up to and including 6.0 SF
Type .4 = Cross sectional area of utility over 6.0 SF, up to and including 10.0 SF
Type .5 = Cross sectional area of utility over 10.0 SF, up to and including 15.0 SF
Type .6 = Cross sectional area of utility over 15.0 SF, up and including 20.0 SF
Type .7 = Cross sectional area of utility over 20.0 SF

E. Price to Cover

The unit price bid per linear foot for each of the various items shall cover the cost of all labor, material, equipment, insurance, and incidentals necessary to completely support and maintain and protect and accommodate the integrity of the electric and non-cost sharing gas utilities facilities, which lie completely within the City trench without disruption of service to the customers and in accordance with contract documents. The unit price shall also include the cost of: supports, slings and beams installed for electric and gas utility support; additional supports necessary for multiple facilities that for payment purposes are measured as one facility; any changes to the contractor's proposed or standard methods of operation, changes of sheeting method and configuration where necessary to accommodate the utility; installation of new sewer, water, and catch basin chute connection pipes under, parallel to or near the utilities, and associated house connections; (including the removal of any abandoned existing facilities to be removed under the City Contract as shown on the Contract Drawings) a combination of hand and hand and machine excavation within the zone of protection, backfilling and compacting, in compliance with DOT requirements, around, over, under and between the zones of protection of the utilities; and removal of sheeting around the utilities, and the cost of any impact with maintenance and protection of traffic. The price shall also cover any additional excavations, including hand and hand and machine excavations under and in between zones of protection for single and multiple utilities, replacement and restoration of any and all conduits and their encasements which may have been temporarily removed during the course of work in order to facilitate supporting and protecting the integrity of the utility facility; tunneling; additional pipe cutting and joining; removal of existing city facilities; snaking and/or in between electric and gas utility facilities and other existing structures.

Sand backfill material shall be used around oil-o-static pipes and gas facilities and will be paid under item JB 303.

F. References

1. Sketches JB 100A, A-1, B, C, C-1, D, and E
4. NYS Industrial Code Rule 753
5. JB 303

JB 330T - SUPPORT AND PROTECTION OF COMMUNICATION UTILITY FACILITIES DURING EXCAVATION OF CITY TRENCH WHEN FACILITIES LIE IN OR IN CLOSE PROXIMITY TO TRENCH LIMITS

A. Description

Under this section, the Contractor shall provide all incremental labor, materials, equipment and incidentals required for trench excavation when protecting, maintaining and accommodating the integrity of Communication utility facilities of various sizes and configurations, which may include but not limited to:

1. Conduits
2. Conductors
3. Concrete Encased Conduit Banks
4. Steel Pipes

When:
(1) Paralleling Communication facilities lie completely in the proposed trench.
(2) Paralleling Communication facilities lie adjacent to trench and Contractor modifies trench and or sheeting.

The contract items specified under this section shall **not** be measured for payment in conjunction with any other types of utility items. All work shall be performed in accordance with Contract plans, specifications, attached sketches JB 330A, JB 330B and JB 330C. Construction method guidelines for other JB Items, although not used for payment purposes, shall be used as specified or as deemed applicable by the facility operator in consultation with the Resident Engineer. In consultation with the Resident Engineer, the facility operator through its authorized representatives shall be solely responsible for the approval of methods used by the contractor to support and protect utility facilities. All work shall be performed without risking the integrity of the utility facility, consistent with all applicable safety standards as directed by the facility operator in consultation with the Resident Engineer.

B. Materials

Contractor shall assume that all materials used shall be supplied by the contractor and approved by the facility operator(s) in consultation with the Resident Engineer. All materials subject to approval by NYC shall comply with all applicable NYC DEP/DOT/DDC Specifications.

C. Method of Construction

The Facility operator shall identify the locations of all Communication utility facilities within the Contract area as required by New York State Industrial Code Rule 753. The limits of the proposed city trenches shall be determined as per DEP/DDC Standards. Before the start of excavation, the Contractor shall locate the Communication utility facility in question to the utility operator(s) satisfaction, whether via test pitting or other means. The facility operator(s) in consultation with the Resident Engineer may direct the Contractor to expose the facility. If so

directed, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the top and 1 foot of each side of the Communication facilities, in order to ascertain the numerical relationships and/or dimensions of these facilities with respect to the proposed excavation. Dependant on the findings, the Contractor shall proceed as follows:

330T1 Paralleling Communication facilities lie completely in the proposed trench

The Contractor, after having successfully exposed the Communication facilities to the satisfaction of the utility operator, and confirming that the facilities lie within the proposed city trench limits, see Sketch JB 330A, shall support, maintain and protect these facilities using methods and materials approved by the facility operator. The contractor shall have the option, with the concurrence of the facility operator and dependent on the conduit material, to modify the Communication utility facility, such as remove concrete encasement or cables from their conduits. This operation and the final restoration of the conduit shall be performed as described in applicable JB Items, or shall be a method approved by the facility operator in consultation with the Resident Engineer.

Paralleling Communication facilities lie adjacent to proposed trench and Contractor modifies trench

Once the location of the Communication utility facility has been identified to the satisfaction of the facility operator(s) and the Communication facility is outside but adjacent to the proposed trench excavation limit, the Contractor shall confer with the facility operator(s) in consultation with the Resident Engineer to determine any possible damage to the integrity of the facility due to the proposed trench. If the facility operator determines that the utility integrity is in question – even though the utility facility shall be outside the limits of the proposed excavation:

330T2.1 Communication Facility operator(s) requests the trench be widened

The Contractor shall develop a method, satisfactory to the Communication facility operator in consultation with the Resident Engineer, to capture the utility facility within the proposed trench. In addition, the Contractor shall develop a support method satisfactory to the facility operator in consultation with the Resident Engineer and consistent with the Contract drawings. The Contractor shall then be permitted to widen the proposed trench in order to excavate around the Communication facility. Refer to Sketch JB 330B. This special care excavation denoted as Area 'A' shall be done with a combination of hand, and hand and machine excavation as described in (1) above. Prior to starting work the Contractor shall notify and obtain the approval of the Resident Engineer for trench modification.

330T2.2 Communication Facility operator(s) requests the trench and/or sheeting be modified

The Contractor shall develop a method, satisfactory to the facility operator in consultation with the Resident Engineer, to exclude the Communication facility from the proposed trench and sheeting. The contractor shall, as part of his investigation, obtain the approval of the NYC Resident Engineer for his proposed sheeting modification. If deemed feasible by both the utility operator and the Resident Engineer the Contractor may proceed.

Refer to Sketch JB 330C.

D. Method of Measurement

330T1 Paralleling Communication facilities lie completely in the proposed trench

The Contractor shall be paid per Linear Foot (L.F.) of trench actually excavated to the limits directed and to the satisfaction of the Communication facility operator in consultation with the Resident Engineer.

Paralleling Communication facilities lie adjacent to proposed trench and Contractor modifies trench

330T2.1 Communication Facility operator(s) requests the trench be widened

The contractor shall be paid per Linear Foot (L.F.) of trench actually excavated to the limits directed and to the satisfaction of the Communication facility operator(s in consultation with the Resident Engineer.

330T2.2 Communication Facility operator(s) requests the trench/sheeting be modified

The Contractor shall be paid per Linear Foot (L.F.) of trench/sheeting modified, to the limits directed and to the satisfaction of the Communication facility operator in consultation with the Resident Engineer.

E. Price to Cover

The unit price bid per linear foot shall, as applicable, include the incremental cost of all labor, material, equipment, insurance, and incidentals necessary to completely expose, support, maintain, protect and accommodate the integrity of the Communication utility without disruption of service to the utility customers and in accordance with contract documents, associated maintenance of traffic and traffic plates and the modification of sheeting method and means, the cutting, breaking and removal of various thickness of surface and base pavement beyond the limits of the contract bid items, the excavation by hand to expose existing structures, the furnishing, placing and tamping of backfill when vertical and/or horizontal adjustments are required. The unit price shall also include the cost of: supports,

slings and beams installed for Communication utility support; additional supports necessary for multiple facilities that may require their support to be modified, changes of sheeting method and configuration where necessary to accommodate the Communication utility and any changes to the Contractor's proposed or standard method of operation; installation of new sewer, water, catch basin chute connection pipes and associated house connections under the Communication utility; (including the removal of any abandoned existing facilities to be removed under the City Contract as shown on the Contract Drawings) a combination of hand and hand and machine excavation within the zone of protection, backfilling and compacting around, over, under and between the zones of protection of the utility; and removal of sheeting around the utility, cost of any temporary pavement and the cost of any impact to the maintenance and protection of traffic. The price shall also cover any additional excavations, including hand and hand and machine excavations under and in between zones of protection for single and multiple Communication utility; tunneling; additional pipe cutting and joining; removal of existing city facilities; snaking and/or in-between utility facilities and other existing structures.

Where the facility operator in consultation with the Resident Engineer has determined that additional excavation is required for the horizontal and/or vertical adjustment required beyond the trench limits, the unit price will also cover the cost of: breaking out, removal and disposal of plain or reinforced concrete encasement and conduits, replacement with field split, split and solid conduits, adapters, clamps, straps and couplings, unloading and storage of the same, furnish and install concrete encasement, supports, slings and beams for Communication utility support, changes of sheeting method and/or configuration when required and where necessary to accommodate the utility during all phases of contract work, cost of any additional excavation and restoration, both temporary and permanent, any and all lost productivity costs related to installation of proposed City facility, and removal of sheeting around the utility and all else necessary and required to complete the work. The unit price shall also include any additional cost arising from the Contractor's loss of productivity, bonus or delay incentives, weather related losses, time delays or any changes to the Contractor's standard or proposed methods due to the modification of trench measurements to accommodate the utility.

F. References

1. Sketches JB 330A, 330B and 330C
2. NYS Industrial Code Rule 753
3. NYC Standard Water Main Specification
4. NYC Standard Sewer Specification

JB 400 - TEST PITS FOR UTILITY FACILITIES

A. Description

Under this section, the Contractor shall furnish all labor, materials, equipment, insurance and incidentals necessary to excavate, sheet and maintain test pits at locations approved by the facility operator in consultation with the Resident Engineer. Test pits shall be dug in order to ascertain exact locations, cover, and invert elevations, configurations, clearances, alignment and operating status of existing utility facilities. The contractor shall inspect jointly with the facility operator and Resident Engineer, utility facilities and other structures uncovered, take all relevant measurements and elevations as directed by the facility operator(s) in consultation with the Resident Engineer. Tests to determine operating status of utility facilities shall be performed by facility operator. The pits shall be covered with steel plates during non-working hours, and uncovered, as required, until the inspection work is completed. Testing of utility facilities may require a maximum of 4 hours. Then, the pits shall be backfilled with clean fill, and resurfaced with temporary pavement. All traffic shall be maintained and all safety measures as stipulated shall be complied with.

B. Materials – N/A

C. Methods of Construction

1. Excavation – Existing pavement to be removed shall be neatly cut along lines of removal with a saw or other approved equipment which leaves a neat straight joint line along the juncture with subsequently replaced pavement. Excavation in the vicinity of utilities and other structures shall be performed using hand tools. Use of hand operated pneumatic and electric jackhammers will be permitted only for breaking pavement and removal of masonry, concrete and boulders, or as otherwise directed by the facility operator in consultation with the Resident Engineer. All materials excavated from test pits shall be properly disposed of away from site by the contractor. Test pits shall be excavated at locations as directed by the facility operator in consultation with the Resident Engineer. All test pits shall be excavated to a depth and size necessary to locate the existing facilities. All facilities that are encountered during the excavation of the test pit shall be supported and protected in a manner suitable to the facility operator. Sheeting shall be used when depth of excavation exceeds five feet. The sheeting required should be furnished and installed in full compliance with the State of New York and Federal Safety Codes requirements and as specified in contract, whichever is more stringent.

Care shall be taken that no existing utility facilities or other structures are broken or damaged. All broken or damaged facilities shall be reported immediately to facility operator who shall decide whether such facilities shall be repaired or replaced by company forces or by City contractor. Contractor shall excavate all material encountered, including large masses of concrete, cemented masonry and boulders, as directed by the facility operator. Any type of excavation protection used shall satisfy the following:

- Industrial Code Rule 753.
- Prevent injury to workers and the public, and avoid damage to existing utility facilities and structures, and to pavements and their foundations, from caving or sliding banks within the excavation.

2. Maintenance of Test Pits - Excavated test pits shall be maintained free of debris and kept dry by the contractor in order to permit the inspection and measurements and to determine the locations of facilities. In order to accomplish this, contractor shall, upon completion of excavation and placement of sheeting (if depth greater than five feet), furnish and install adequate steel plates and posting over the excavated pits and shall temporarily remove all equipment debris and workers, and relocate barricades in order to open the full width of street to traffic during non-working hours. The contractor shall then, at no additional cost, relocate such barricades barrels, cones and other warning devices and remove steel plates, as and when directed by the facility operator in consultation with the Resident Engineer to facilitate the inspection of exposed facilities. When work is being performed and the pits are not covered with steel plates, the contractor shall provide complete and safe access to the test pits as may be required, and he shall provide construction barricades and maintain traffic at all times as shown or as directed by the facility operator in consultation with the Resident Engineer. Upon completion of test pit inspection by the facility operator, the pit shall be backfilled by the contractor in accordance with Contract requirements and all backfill material shall conform to contract specifications for such purpose.

3. Pavement and Sidewalk Restoration - After backfilling is completed, the contractor shall construct a temporary pavement consisting of six inches (6") thick asphaltic concrete mixture in roadway areas or a two inches (2") thick asphaltic concrete mixture in sidewalk areas in order to maintain existing pedestrian and vehicular traffic. This temporary pavement shall be maintained until permanent replacement as specified in contract.

D. Method of Measurement

The quantity to be measured for payment shall be the number of cubic yards of material removed from within the limits of the pit dimensions as directed by the facility operator in consultation with the Resident Engineer. The volume occupied by existing pipes or other structures remaining within the maximum payment lines will not be deducted from the total volume measured except, where the cross sectional area of these facilities exceeds four (4) square feet. As determined by the facility operator(s) in consultation with the Resident Engineer, the quantity measured for payment may be prorated among the facility operator(s) involved in total volume excavated.

E. Price to Cover

The unit price bid per cubic yard for test pits shall cover all costs of labor, material, equipment, insurance and incidentals required to excavate test pits, including removal and disposal of excavated materials, sheeting, steel plating, all associated maintenance of traffic, backfill and compaction, in compliance with DOT requirements, all in accordance with the specifications and at the direction of the facility operator in consultation with the Resident Engineer. The price shall also cover the cost of providing temporary pavements and sidewalks. The price shall also include the cost of providing safe access to the excavation by facility operator for the performance of certain test to determine operating status of utility facilities prior to City work. The price shall also include the necessary support and protection of all utility facilities crossing, paralleling and /or encroaching the test pit excavation.

F. References

1. NYS Industrial Code Rule 753

JB 401 - TRENCH EXCAVATION FOR ADJUSTMENT OF UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to excavate by hand to locate and expose subsurface utilities encountered during construction in preparation for horizontal and vertical movement (covered by other Sections), and to support and maintain and protect the integrity of utility facilities including but not limited to:

1. Conduits;
2. Conductor(s) and/or cable(s);
3. Concrete Encased Conduit Bank(s);
4. Steel Pipe(s)

The trench to be excavated shall be determined by the size of the utility and the extent of adjustment required to avoid interferences as detailed on Sketch JB 402 A during all phases of contract work. The work shall be performed in accordance with the specifications, and at the directions of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to support and maintain and protect shall be similar to those indicated on Sketches JB 100 A and 100 A-1 and shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

The Contractor shall cut, break and remove various thickness of surface and base pavement, excavate by hand to expose, support and protect all utility facilities within the trench and then furnish and tamp backfill after work has been completed by the parties indicated under other Sections. The facility operator(s) shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the utility. Upon exposing the affected utilities sufficiently to determine relationships and/or clearances at the sole discretion of the facility operator in consultation with the Resident Engineer, the Contractor shall be permitted to proceed with a combination of hand and machine excavation sufficiently to wingback all interferences of cable and conduit. The trench shall be adjusted so as to provide a nominal cover of 24" over the highest conduit. The width of the trench shall be as directed by the facility operator in consultation with the Resident Engineer. The bottom of the trench shall be graded smooth and tamped to minimize initial settlement and to avoid "point" support of conduits. All stones projecting into the trench bottom shall be removed, and the voids backfilled before conduits are placed. Where streets are not to final grade, the cover shall be measured from the final grade, or the existing grade, whichever provides the deeper trench.

D. Method of Measurement

The Contractor shall be paid per cubic yard (C.Y.) of trench actually excavated to the limits directed as detailed in Sketch JB 402 A and to the satisfaction of the facility operator in consultation with the Resident Engineer. When two or more utility facilities requiring horizontal or vertical adjustment with different owners are in the same trench, the facility operators shall jointly determine the percentage of ownership of the trench.

E. Price to Cover

The unit price bid per cubic yard for excavation shall include the cost of all labor, materials, equipment, insurance, and incidentals necessary to completely expose, support and protect and maintain the integrity of the facilities without disruption of service to the customers and in accordance with the Contract Documents, associated maintenance of traffic, and traffic plates and sheeting that may be required, cut, break and remove various thickness of surface and base pavement, excavate by hand to expose existing structures, furnish, place and tamp backfill after required vertical and/or horizontal adjustments have been completed under other Sections. Any required removing, trucking, storing, and disposing of material shall be deemed included in the unit price. The unit price shall also include the cost of providing temporary pavement restoration. Permanent pavement restoration shall be paid under other items. The cost for supporting and protecting all other utilities encountered including the installation of slings and beams installed for utility support shall be paid under other applicable items, if required.

F. References

1. NYS Industrial Code Rule 753
2. Sketch JB 100 A and A-1
3. Sketch JB 402 A

JB 401A - SPECIAL CARE PAVEMENT EXCAVATION FOR ADJUSTMENT OF UTILITY FACILITIES CONNECTED TO THE BASE PAVEMENT

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, and incidentals required to carefully excavate pavement to locate, expose, maintain and protect subsurface utilities within or connected to the pavement structure prior to roadway reconstruction or trench excavation. This work shall be performed in order to separate existing ducts and or cables from the existing pavement. The utility facilities, excluding Cable TV and Telecommunication facilities include, but are not limited to:

1. Conduits
2. Cables
3. Concrete encased or partially encased conduit banks or cables
4. Steel Pipes

located both beneath and within the existing pavement, base and/or sub base. The work shall be performed at the direction of the facility operator in consultation with the Resident Engineer.

Refer to item JB 401AC for special care pavement excavation for adjustment of Cable TV facilities connected to the base pavement and item JB 401AT for special care pavement excavation for adjustment of Telecommunication facilities connected to or near the base pavement.

B. Material – N/A

C. Methods of Operation/Construction

Once the clearances have been verified by available records, NYS Industrial Code Rule 753 and/or information obtained from test pits, or any combination thereof, to the sole satisfaction of the facility operator in consultation with the Resident Engineer, the Contractor shall exercise extreme caution, by utilizing appropriate methods of operation/construction, by employing specialized construction equipment and special operations and sequencing, within the area designated for protection and accommodation of utility facilities as shown on the plans or where the aforementioned utility structure is connected to or within the pavement structure, or as otherwise directed by the facility operator in consultation with the Resident Engineer. The work shall incorporate the removal of temporary and existing pavement, base material, and a portion of the duct encasement. Trench width shall be no less than 1' 6" to either side of the duct centerline alignment, all as determined by the facility operator in consultation with the Resident Engineer. Pavement connecting the duct or cable shall be removed using hand-operated tools using whatever methods necessary to protect the facility from damage, regardless of the pavement composition. Only excavators working off or from adjacent undisturbed pavement may assist the operation of moving the hand-excavated material from the trench area. All equipment and methods and maintenance and protection provisions shall require approval by the facility operator in consultation with the Resident Engineer.

D. Method of Measurement

The quantity of Special Care Excavation for Adjustment of Utility Facilities to be measured for payment shall be the number of cubic yards of (C.Y.) of Trench excavated. Modifications to work methods required adjacent to any existing structure/curb shall not be measured for payment and are deemed to be included in the price bid for this item.

E. Price to Cover

The unit price bid per cubic yard (C.Y.) for Special Care Excavation for Adjustment of Utility Facilities, shall include the cost of all labor, materials, equipment, insurance and incidentals required for excavation and disposal of pavement, base and a portion of the duct encasement material, hand excavation, backfill and compaction, all together with necessary incidentals, in accordance with the directions of the facility operator in consultation with the Resident Engineer. The unit price shall also cover the cost of providing temporary pavements and sidewalks. The unit price bid shall further include the cost of maintaining, protecting, and accommodating the integrity of utility facilities during the work within the areas designated on the plans or as directed by the facility operator in consultation with the Resident Engineer.

Payment for all work herein specified shall be made on a one-time basis only; no payment for work herein specified shall be made for the same conduit or cable more than one time. No payments will be made under this item if the Contractor excavates beyond the limits specified in the contract, unless directed by the facility operator in consultation with the Resident Engineer. In addition, work under this item may be paid in combination with other utility or facility accommodation items under other contract items.

F. References

1. NYS Industrial Code Rule 753
2. Sketch JB 401AC
3. Item JB 401AC
4. Item JB 401AT

JB 401AC - SPECIAL CARE PAVEMENT EXCAVATION FOR ADJUSTMENT OF CABLE TV FACILITIES CONNECTED TO THE BASE PAVEMENT

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, and incidentals required to carefully excavate pavement to locate, expose, maintain and protect subsurface cable TV facilities within or connected to the pavement structure prior to roadway reconstruction or trench excavation. This work shall be performed to separate existing ducts and or cables to remain from the existing pavement. The facilities include, but are not limited to:

1. Conduits;
2. Cables;
3. Concrete encased or partially encased conduit banks or cables;
4. Steel Pipes;

located both beneath and within the existing pavement, base and/or subbase. The work shall be performed in accordance with the plans, specifications and at the directions of the facility operator in consultation with the Resident Engineer.

B. Material – N/A

C. Methods of Operation/Construction

Once the clearances have been verified by available records, NYS Industrial Code 753 and/or information obtained from test pits (excavated under other contract items), or any combination thereof, to the sole satisfaction of the facility operator in consultation with the Resident Engineer, the Contractor shall exercise extreme caution, by utilizing appropriate methods of operation/construction, by employing specialized construction equipment and special operations and sequencing, within the area designated for protection and accommodation of utility facilities as shown on the plans or where the aforementioned utility structure is connected to or within the pavement structure, or as otherwise directed by the facility operator in consultation with the Resident Engineer. The work shall incorporate the removal of temporary and existing pavement, base material, and the duct encasement in a manner commensurate with JB 401AC sketches. Trench width shall be no less than 1'-6" to either side of the duct centerline alignment, all as determined by the facility operator in consultation with the resident Engineer. Where two or more parallel ducts are less than five feet apart, the interspaced pavement and 1'-6" to the outside of them shall be removed under this item. The outside limits of excavation shall be saw cut to the full depth of the pavement unless approved otherwise by the facility operator in consultation with the Resident Engineer. Pavement connecting the duct or cable shall be removed using hand-operated/hand held tools using whatever methods necessary to protect the facility from damage, regardless of the pavement composition. Hand operated/hand held tools shall include jackhammers, chisels and sledgehammers. Only machine excavators and backhoes working off or from adjacent undisturbed pavement may assist the operation of moving the hand-excavated material from the trench area. All equipment and methods and maintenance and protection provisions shall require full authorization by the facility operator in consultation with the Resident Engineer.

D. Method of Measurement

The quantity of Special Care Excavation for Adjustment of Cable TV Facilities to be measured for payment shall be the number of cubic yards of (C.Y.) of trench excavated. Modifications to work methods required adjacent to any existing structure/curb shall not be measured for payment and are deemed to be included in the price bid for this item.

E. Price to Cover

The unit price bid per cubic yard (C.Y.) for Special Care Excavation for Adjustment of Cable TV Facilities, shall include the cost of all labor, materials, time, equipment, and incidentals required for excavation and disposal of pavement, base and a portion of the duct encasement material, to include hand excavation, machine excavation, backfill, compaction, saw cutting, chiseling, chipping, jack hammering, maintenance and protection of traffic, temporary pavement, lighting, insurance and all necessary incidentals, in accordance with the plans, the specifications and as directed by the facility operator in consultation with the Resident Engineer. The unit price bid shall further include the cost of maintaining, protecting, and accommodating the integrity of utility facilities during the work within the areas designated on the plans or as directed by the facility operator in consultation with the resident Engineer. Adjustment of the ducts after this work is complete is to be paid under other contract items, as applicable.

Payment for all work herein specified shall be made on a one-time basis only; no payment for work herein specified shall be made for the same conduit or cable more than one time. No payments will be made under this item if the Contractor excavates beyond the limits specified in the contract, unless directed by the facility operator in consultation with the Resident Engineer. In addition, work under this item may be paid in combination with other utility or facility accommodation items under other contract items.

F. References

1. NYS Industrial Code Rule 753
2. Sketch JB 401AC

JB 401AT - SPECIAL CARE PAVEMENT EXCAVATION FOR ADJUSTMENT OF TELECOMMUNICATIONS FACILITIES CONNECTED TO OR NEAR THE BASE PAVEMENT

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, and incidentals required to modify his work methods to carefully excavate pavement to locate, expose, maintain and protect subsurface telecommunication facilities within or connected to the pavement structure. The provisions of this Item shall be applicable during the removal of existing and temporary pavement, under the contract Items, prior to roadway reconstruction or trench excavation and shall extend to final roadway reconstruction. This Item shall be used in lieu of Item JB 700 in those areas where the depth of saw cutting is restricted and the manner of removal of pavement and base is restricted to hand tools as defined in Section "C" of this specification and as delineated in the contract drawings. The facilities include, but are not limited to:

1. Conduits;
2. Cables;
3. Concrete encased or partially encased conduit banks or cables;
4. Steel Pipes;

located both beneath and within the existing pavement, base and/or sub base. The work shall be performed in accordance with the plans, specifications and at the directions of the facility operator in consultation with the Resident Engineer.

B. Material – N/A

C. Methods of Operation/Construction

Once the clearances have been verified by available records, NYS Industrial Code 753 and/or information obtained from test pits (excavated under other contract items), or any combination thereof, to the sole satisfaction of the facility operator in consultation with the Resident Engineer, the Contractor shall exercise extreme caution in removing the pavement and base and sub base. All saw cutting shall be limited to a depth not to exceed 4 inches from the existing roadway pavement. Removal of the wearing course and base shall be limited to hand held tools only – jackhammers shall be limited to a maximum weight of ninety (90#) pounds or less and shall be supplied with spade bits only. The work shall incorporate the removal of temporary and existing pavement, base material, and the duct encasement. Only machine excavators and backhoes working off or from adjacent undisturbed pavement may assist the operation of moving the hand-excavated material from the designated area. Absolutely no track vehicle shall be allowed in the designated area either before or after the telecommunication facilities is exposed. Any rubber tire vehicle inducing impact loads greater than 4000 pounds shall not transverse the designated area until final pavement is placed All equipment and methods and maintenance and protection provisions shall require full authorization by the facility operator in consultation with the Resident Engineer before initiating work. The Contractor shall not store any materials nor stand any vehicle/piece of equipment on the unpaved designated area.

All provisions of Item JB 700, Section 'C' are applicable except that the pavement and base removal shall be governed by the above criteria.

D. Method of Measurement

The quantity of Special Care Excavation for Adjustment of Telecommunication Facilities to be measured for payment shall be the number of cubic yards of (C.Y.) of pavement and sub-grade material of whatever nature encountered actually removed and disposed of. The horizontal zone of protection shall be as designated in the contract drawings and specifications or as defined by the facility operator in consultation with the Resident Engineer. Modifications to work methods required adjacent to any existing structure/curb shall not be measured for payment and are deemed to be included in the price bid for this item.

E. Price to Cover

The unit price bid per cubic yard (C.Y.) for Special Care Excavation for Adjustment of Telecommunications Facilities Connected to or Near the Base Pavement shall include the incremental cost of all labor, materials, time, equipment, and incidentals required for excavation and disposal of pavement, base and sub base and conduit(s) encasement material, to include hand excavation, adjacent machine operation, maintenance and protection of traffic, temporary pavement and any alterations to the method of sub base placement, compaction, placement of base concrete and final pavement. The unit price shall also include all incremental changes to lighting, insurance and all necessary incidentals, in accordance with the plans, the specifications and as directed by the facility operator in consultation with the Resident Engineer. The price bid shall further include the cost of maintaining, protecting, and accommodating the integrity of utility facilities during the work within the areas designated on the plans or as directed by the facility operator in consultation with the resident Engineer. Adjustment of the ducts after this work is complete is to be paid under other contract items, as applicable.

Payment for all work herein specified shall be made on a one-time basis only; no payment for work herein specified shall be made for the same conduit or cable more than one time. No payments will be made under this item if the Contractor excavates beyond the limits specified in the contract, unless directed by the facility operator in consultation with the Resident Engineer. In addition, work under this item may be paid in combination with other utility or facility accommodation items under other contract items.

F. References

1. NYS Industrial Code Rule 753
2. JB 700

JB 402 - HORIZONTAL AND VERTICAL ADJUSTMENT OF UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to adjust, support, protect, maintain and accommodate the integrity of utility facilities, excluding telecommunication facilities, including but not limited to:

1. Conduit(s);
2. Conductors and/or Cables;
3. Concrete Encased Conduit Banks

The work shall be performed in accordance with specifications, the attached Sketch # JB 402 A and at the directions of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to adjust, support, protect, maintain and accommodate the integrity of utility facilities shall be similar to those indicated on the standard Sketches JB 100 A & 100 A-1 and shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

Materials used for replacing conduit(s) removed under this item shall be supplied by the facility operator(s) and installed by the Contractor and shall include but not be limited to the following:

1. Bends
2. Split and Solid Conduit(s)
3. Couplings and Adapters
4. Straps or plastic ties

Materials supplied by the facility operator shall be delivered to the contractor's designated storage area. Contractor shall comply with Sections 2 and 3 of the General provisions.

C. Methods of Construction

Methods of construction shall include but not be limited to the following:

1 Removal and Support

a. Break with hand held power tools, remove and dispose of plain or reinforced concrete encasement (excluding concrete conduit(s)).
b. Break with hand held power tools, remove and dispose of conduit(s) enclosures and conduit that contain conductor(s) and/or cable(s).
c. Support and protect conductor(s) and/or cable(s) as shown in Sketch JB 100A-1.

2 Adjust or Move Conductor(s) and/or cable(s) and support

a. Cable shall be relocated horizontally and/or vertically as directed by the facility operator in consultation with the Resident Engineer and in accordance with Sketch # JB 402 A.
b. Support and protect conductors and/or cables as shown on Sketch # JB 100 A-1.

3 Replacement, Encasement, Protection and Support

a. Replace vacant and loaded conduit(s) with solid and/or split conduit(s) and adapters.

1) Vacant Conduit - Repairs to conduits shall not be permitted. All damaged or impaired lengths of conduit(s) shall be removed and replaced with new conduit(s).

2) Loaded Conduit - Replacement of conduits that are removed from around existing conductors and/or cable(s) shall be accomplished with precast concrete conduit field split or split plastic. When a concrete conduit is field split for installation around existing conductor(s) and/or cable(s), either singly or in banks of conduit, it shall be secured with clamps or straps. Where split and solid plastic conduit is used, the conduit(s) shall be spaced 1½ inches from each other and the conduit bank shall be encased in 3200 PSI concrete to two (2) inches outside the limits of the plastic conduit. Encasement shall overlap a minimum of two (2) feet beyond the adapter. The concrete conduits, which are double male end types, shall be joined with a force fit plastic coupling. The plastic coupling, when used for split concrete conduit, shall be cut and wrapped around the ends. Plastic conduit shall be joined with plastic couplings.

3) Adapting - Joining new precast concrete conduit and plastic conduit to existing conduits of other diameters or material shall be done using single or multiple adapters (supplied by facility operator).

b. If due to subsurface conditions, the cover is less than 20" from finished grade, the duct shall be protected with steel plates furnished by the facility operator(s) and measured for payment under Item JB-403.

c. Support and protect cable(s) and/or conductor(s) and conduit(s).

d. Encase plastic conduit with concrete.

D. Method of Measurement

The quantity to be measured for breaking out conduits, removing concrete, moving, protecting and supporting conductors and replacing conduits with split and solid conduit, shall be paid for by the linear foot (L.F.) of each conduit. A linear foot of conduit shall be defined as one (1) single conduit measured along its longitudinal axis that has been broken out or moved from its original location either horizontally and/or vertically and measured in its final location between the limits shown on Sketch JB 402A. Where multiple separate conduits exist within a single enclosed unit similar to Murray or multiple tile conduits, each separate conduit within the enclosed unit shall be measured for payment under this item. All conduits removed and not restored shall be covered for payment under the appropriate bid items for Removal of Abandoned Masonry for Utility Facilities and/or Removal of Abandoned Utility Conduits.

Each type of utility adjustment shall be paid for separately; the types of utility adjustments are defined as follows:

JB-402.1 Existing Concrete Encased Conduits Placed in Final Position without Concrete Encasement. (L.F.)

JB-402.1A Existing Concrete Encased Conduits Placed in Final Position with Concrete Encasement. (L.F.)

JB-402.2 Existing Non-Concrete Encased Conduits Placed in Final Position without Concrete Encasement. (L.F.)

JB-402.2A Existing Non-Concrete Encased Conduits Placed in Final Position with Concrete Encasement. (L.F.)

E. Price to Cover

The unit price bid per linear foot (L.F.) of conduit shall cover the cost of all labor, material, equipment, insurance, and incidentals necessary to shift, adjust, support, protect, maintain and accommodate the integrity of utilities without disruption of service to the customers and in accordance with contract documents. The unit price bid shall also include the cost of: breaking out, removal and disposal of plain or reinforced concrete encasement and conduits, replacement with field split, split and solid conduits, adapters, clamps, straps and couplings supplied by facility operator(s); furnish and install concrete encasement, supports, slings and beams for utility support; changes of sheeting method and/or configuration when required and where necessary to accommodate the utilities during all phases of contract work; any impact associated with maintenance and protection of traffic; and removal of sheeting around the utilities, and all else necessary and required to complete the work.

F. References

1. Sketches JB 100A and 100A-1
2. Sketch JB 402A
3. JB 403

JB 402T - HORIZONTAL AND VERTICAL ADJUSTMENT OF TELECOMMUNICATIONS FACILITIES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to adjust, support, protect, maintain and accommodate the integrity of telecommunication facilities including but not limited to:

1. Conduit(s);
2. Cables and Air Pipe
3. Concrete Encased/Capped Conduit Banks

The work shall be performed in accordance with specifications and at the direction of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to adjust, support, protect, maintain and accommodate the integrity of utility facilities shall be similar to those indicated on the standard Sketches JB 100 A & 100 A-1 and shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer .

Materials used for replacing conduit(s) removed under this item shall be supplied by and installed by the Contractor and shall include but not be limited to the following:

1. Bends
2. Split and Solid Conduit(s) PVC and Steel
3. Couplings and Adapters PVC, Tile and Steel
5. Straps or plastic ties

PVC conduit and fittings shall be as supplied by American Pipe and Plastics, Type "C" or approved equivalent.
Steel Pipe and fittings shall conform to ASTM A53 Schedule 40
Tile to PVC adaptors shall be as supplied American U-Tel or approved equivalent.

C. Methods of Construction

Lengths of "wing-back" shall be determined by the facility operator in consultation with the Resident Engineer. All work performed prior to that approval shall be at the contractors risk.

Methods of construction shall include but not be limited to the following:

1 Removal and Support

a. Break with hand held power tools, remove and dispose of plain or reinforced concrete encasement
b. Break with hand held power tools, remove and dispose of conduit(s) enclosures and conduit that contain conductor(s) and/or cable(s) except steel/Iron conduits, inner ducts and 1 ¼" to 1 ½" PVC "quad ducts. Breaking – "ringing and ripping" - of

steel/iron conduits belonging to ECS shall be performed by ECS forces only. Contractor shall make safe the work area to accommodate the ECS forces.

c. Support and protect exposed conduits, cables, innerduct and airpipe as shown in Sketch JB 100A-1 and approved by the facility operator in consultation with the Resident Engineer.

d. ECS tenants cables may require inspection, testing and encapsulation before they can be shifted. Contractor shall make safe the work area to accommodate these forces. Contractor shall be notified by the facility operator of the ECS tenant requirements before the conduits are broken-out.

2 Adjust or Move Conductor(s) and/or cable(s) and support

c. Cable shall be relocated horizontally and/or vertically as directed by the facility operator in consultation with the Resident Engineer

d. Support and protect conductors and/or cables as shown on Sketch # JB 100 A-1 and/or as directed by the facility operator.

3. Replacement, Encasement, Protection and Support

a. Replace vacant and loaded conduit(s) with solid and/or split conduit(s) and adapters.

1) Vacant Conduit - Repairs to conduits shall not be permitted. All damaged or impaired lengths of conduit(s) shall be removed and replaced with new conduit(s). The number of vacant conduits replaced shall be confirmed by the facility operator.

2) Loaded Conduit - Replacement of conduits that are removed from around existing cable(s) or innerduct shall be accomplished with split plastic (PVC) or split steel conduits as directed by the facility operator. Where split and solid plastic or steel conduit is used, the conduit(s) shall be spaced 1½ inches from each other. All split PVC shall be secured with plastic straps spaced at a maximum distance of eighteen (18") inches. Plastic conduit shall be joined with plastic couplings.

3) Adapting - Joining plastic conduit to existing conduits of other diameters or material shall be done using single or multiple adapters, (supplied by contractor).

b. If due to subsurface conditions, the cover is less than 20" from finished grade, the duct shall be protected with steel plates furnished by the facility operator(s) and measured for payment under Item JB-403.

c. Support and protect cable(s) and/or conductor(s) and conduit(s).

d. Encase all exposed conduit with concrete (f'c = 1200 to 1500 psi maximum) with slump commensurate to completely fill voids around conduits. Concrete encasement shall extend to two (2") inches beyond the limits of the duct bank vertically and horizontally.

D. Method of Measurement

The quantity to be measured for breaking out conduits, removing concrete, moving, protecting and supporting conductors and replacing conduits with split and solid conduit, shall be paid for by the linear foot (L.F.) of each conduit replaced. A linear foot of conduit shall be defined as one (1) single conduit measured along its longitudinal axis that has been broken out or moved from its original location either horizontally and/or vertically and measured in its final location. . Quad PVC ducts produced as one unit shall be consider one duct for each quad unit. All conduits removed and not restored shall be covered for payment under the appropriate bid items for Removal of Abandoned Masonry for Utility Facilities and/or Removal of Abandoned Utility Conduits.

Each type of utility adjustment shall be paid for separately, the types of utility adjustments are defined as follows:

JB-402T.1	Existing Concrete Encased Telecommunication Conduits Placed in Final Position without Concrete Encasement. (L.F.)
JB-402T.1A	Existing Concrete Encased Telecommunication Conduits Placed in Final Position with Concrete Encasement. (L.F.)
JB-402T.2	Existing Non-Concrete Encased Telecommunication Conduits Placed in Final Position without Concrete Encasement. (L.F.)
JB-402T.2A	Existing Non-Concrete Encased Telecommunication Conduits Placed in Final Position with Concrete Encasement. (L.F.)

E. Price to Cover

The unit price bid per linear foot (L.F.) of conduit shall cover the cost of all labor, material, equipment, insurance, and incidentals necessary to shift, adjust, support, protect, maintain and accommodate the integrity of utilities without disruption of service to the facility operator's customers and in accordance with contract documents. The price bid shall also include the cost of: breaking out, removal and disposal of plain or reinforced concrete encasements, replacement with field split, split and solid conduits, adapters, clamps, straps and couplings ; furnish and install concrete encasement, supports, slings and beams for utility support; changes of sheeting method and/or configuration when required and where necessary to accommodate the utilities during all phases of contract work; any impact associated with maintenance and protection of traffic; and removal of sheeting around the utilities, and all else necessary and required to complete the work.

F. References

1. Sketches JB 100A and 100A-1
2. JB 403
3. American Pipe and Plastics, P.O. Box 577, Binghamton, N.Y. 13902
4. American U-Tel, 9760 Smith Rd., Willoughby, Ohio 44094

JB 403 - PLACING STEEL PROTECTION PLATES FOR UTILITY FACILITIES

A. Description

Under this Section, the Contractor shall place permanent Steel protection plates supplied by the facility operator(s) over utility facilities where directed by the facility operator(s) in consultation with the Resident Engineer.

B. Materials

Materials shall be supplied and delivered by the facility operator(s) at the job site or Construction Yard as directed by the Contractor.

C. Method of Construction

Steel protection plates shall be placed in accordance with the attached facility operator(s) Standard Sketch # JB 403 A.

D. Method of Measurement

The quantity for payment shall be the area of permanent steel plating protection installed and measured in Square Feet (S.F.).

E. Price to Cover

The unit price bid shall cover the cost of all labor, material, equipment, insurance, and incidentals necessary to complete the work.

F. References

1. Sketch JB 403A

JB 405 - EXCAVATION FOR INSTALLATION OF UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to excavate and maintain trenches for the installation of new Utility Facilities including but not limited to:

1. Conduits;
2. Non Cost Sharing Gas facilities;
3. Steam Mains;
4. Steel Pipe(s)

The trench to be excavated shall be determined by the size of the utility facility to be installed. The work shall be performed in accordance with applicable specifications, and/or at the direction of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to excavate and prepare trenches shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

1. Excavation – The Contractor shall saw cut and/or break and remove existing roadway which may include but is not limited to, asphalt, concrete and cobblestone, utilizing approved equipment that leaves a neat straight joint line along the juncture with subsequently replaced pavement. The Contractor shall be permitted to excavate utilizing a combination of machine and hand excavation, as field conditions warrant and as directed by the facility operator. The trench shall be adjusted so as to provide for a nominal cover of 24" over the new utility facilities or as required based on field conditions, applicable specifications, or as directed by the facility operator in consultation with the Resident Engineer. The width of the trench shall be as directed by the facility operator in consultation of the Resident Engineer. The bottom of the trench shall be graded smooth with a minimum cushion of 3 inches of sand or in conformance with applicable specification and be compacted, to minimize initial settlement and to avoid "point" support of new utility facilities. All stones projecting into the trench bottom shall be removed, and the voids backfilled before the new utility facilities are installed. Where streets are not to final grade, the cover shall be measured from the final grade, or the existing grade, whichever provides the deeper trench. Excavation in the vicinity of utilities and other structures shall be performed using hand tools. The contractor shall properly dispose of all materials excavated away from site. Size and location of excavation shall be as directed by the facility operator in consultation with the Resident Engineer. Trenches shall be excavated to a depth and size necessary to facilitate the installation of the new utility facility and in conformance with the applicable specification. All existing facilities that are encountered during trench excavating shall be protected in a manner suitable to the facility operator in consultation with the Resident Engineer. Tight sheeting shall be used, as required, based on field conditions and/or

when the depth of excavation is equal to or greater than five feet. Skeleton type sheeting will not be permitted. The sheeting required shall be furnished and installed in full compliance with the State of New York and Federal Safety Code requirements and in compliance with applicable specifications and/or as directed by the facility operator in consultation with the Resident Engineer.

Care shall be taken that no existing utility facilities or other structures are broken or damaged. Contractor shall excavate all material encountered necessary to facilitate the installation of the new utility facilities, and as directed by the facility operator. Care should be taken to avoid damage to existing utility facilities and structures, and to pavements and their foundations, and to avoid caving or sliding banks within the excavation.

2. Maintenance of Trench Excavation - Excavated trenches shall be maintained free of debris and kept dry by the contractor. In order to accomplish this, contractor shall, upon completion of excavation and placement of sheeting (as required and/or if depth is equal to or greater than five feet), furnish and install adequate steel plates, as directed by the facility operator in consultation with the Resident Engineer, and posting over the excavated trenches and shall temporarily remove all equipment debris and workers, and relocate barricades in order to open the full width of street to traffic during non-working hours, as required based on DOT requirements. The Contractor shall then, at no additional cost, relocate such barricades barrels, cones and other warning devices and remove steel plates, as and when directed by the facility operator in consultation with the Resident Engineer to facilitate the installation of the new utility facility. When work is being performed and the excavations are not covered with steel plates, the Contractor shall provide complete and safe access to the trench as may be required, and shall provide construction barricades and maintain traffic at all times as shown or as directed by the facility operator in consultation with the Resident Engineer. Upon completion of installation of the new utility facility, the trench excavation shall be backfilled by the contractor in accordance with Contract requirements and all backfill material shall conform to contract specifications for such purpose.

3. Pavement and Sidewalk Restoration - After backfilling is completed, the contractor shall install temporary pavement consisting of six inches (6") thick asphaltic concrete mixture in roadway areas or a two inches (2") thick asphaltic concrete mixture in sidewalk areas in order to maintain existing pedestrian and vehicular traffic. This temporary pavement shall be maintained until permanent replacement as specified in contract.

D. <u>Method of Measurement</u>

The quantity to be measured for payment shall be the number of cubic yards (C.Y.) of trench actually excavated as directed by the facility operator in consultation with the Resident Engineer. The volume occupied by existing pipes or other structures will not be deducted from the total volume measured.

JB 405.1 Trench Excavations for Installation of Utility Facilities with total depths less than five feet (C.Y.)

JB 405.2 Trench Excavations for Installation of Utility Facilities with total depths equal to or greater than five feet, requiring sheeting (C.Y.)

E. Price to Cover

The unit price bid for the various trench excavation items shall include the cost of all labor, materials, equipment, insurance, and incidentals necessary to completely expose, protect and maintain the integrity of the facilities without disruption of service to the customers and in accordance with the Contract Documents. The price shall also include, associated maintenance of traffic, and traffic plates and openings and closings of plates as may be required in order to provide access to trench, and installing, removing and maintaining tight sheeting that may be required, cut, break and remove various thickness of surface and base pavement, excavate by hand to expose existing structures, furnish, place and compact, in compliance with DOT requirements, clean backfill following installation of utility facility and/or required vertical and/or horizontal adjustments have been completed under other Sections. Any required removing, trucking, storing, and disposing of material shall be deemed included in the unit price. The price shall also include the cost of providing temporary pavement restoration. Permanent pavement restoration shall be paid under other items, only if required and directed by the Resident Engineer. The price shall also include the cost of locating and protecting all utilities encountered as required.

Sand backfill material shall be used around gas facilities and oil-o-static pipes and will be paid for under item JB 303.

F. References

1. JB 303

JB 406 - EXCAVATION FOR UTILITY STRUCTURE

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to excavate and maintain excavations for the installation and/or removal of Utility Structures including but not limited to:

1. Manholes;
2. Service Boxes;
3. Vaults;
4. Splice Boxes

The size of excavation shall be determined based on the utility structure being installed and/or removed, under other contract items. The work shall be performed in accordance with applicable utility specifications, and/or at the direction of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used to excavate and prepare excavations shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

1. Excavation for Utility Structure – The Contractor shall saw cut and/or break and remove existing roadway which may include but is not limited to, asphalt, concrete and cobblestone, utilizing approved equipment that leaves a neat straight joint line along the juncture with subsequently replaced pavement. The Contractor shall be permitted to excavate utilizing a combination of machine and hand excavation, as field conditions warrant and as directed by the facility operator. The excavation shall be adjusted as directed by the facility operator in consultation of the Resident Engineer. Excavation in the vicinity of utilities and other structures shall be performed using hand tools only. The Contractor shall properly dispose of all materials excavated away from site. Size and location of excavation shall be as directed by the facility operator in consultation with the Resident Engineer. The excavation depth and size shall be adjusted to facilitate the installation and/or removal of the utility structure and in conformance with applicable utility specifications. All existing underground facilities that are encountered during excavating for the installation and/or removal of the Utility Structure shall be protected in a manner suitable to the facility operator in consultation with the Resident Engineer. Tight sheeting shall be used, as required, based on field conditions and/or when the depth of excavation exceeds five feet. Skeleton type sheeting will not be permitted. The sheeting required shall be furnished and installed in full compliance with the State of New York and Federal Safety Codes requirements and in compliance with applicable utility specifications and/or as directed by the facility operator in consultation with the Resident Engineer.

Contractor shall excavate all material encountered necessary to facilitate the installation and/or removal of the utility structures, and as directed by the facility operator. Care shall be taken to avoid damage to existing utility facilities and adjacent structures, and to pavements and their foundations, and to avoid caving or sliding banks within the excavation.

2. Maintenance of excavation to install and/or remove Utility Structures - Excavation shall be maintained free of debris and kept dry by the Contractor. In order to accomplish this, contractor shall, upon completion of excavation and placement of sheeting (as required and/or if depth of excavation is equal to or greater than five feet), furnish and install adequate steel plates, if required and as directed by the facility operator in consultation with the Resident Engineer, and shall temporarily remove all equipment debris and workers, and relocate barricades in order to open the full width of street to traffic during non-working hours, in conformance with City DOT requirements. The Contractor shall then, at no additional cost, relocate such barricades, barrels, cones and other warning devices and remove steel plates, as and when directed by the facility operator in consultation with the Resident Engineer to facilitate the installation and/or removal of the utility structure. When work is being performed and the excavations are not covered with steel plates, the Contractor shall provide complete and safe access to the excavation as may be required, and shall provide construction barricades and maintain traffic at all times as shown or as directed by the facility operator in consultation with the Resident Engineer. Upon completion of installation and/or removal of the utility structure, the contractor shall furnish and install backfill and compact the excavation around the new structure in accordance with Contract requirements. All backfill material shall conform to contract specifications for such purpose.

3. Pavement and Sidewalk Restoration - After backfilling and compaction is completed, the Contractor shall install temporary pavement consisting of six inches (6") thick asphaltic concrete mixture in roadway areas or two inches (2") thick asphaltic concrete mixture in sidewalk areas, and in compliance with DOT requirements and as directed by the Facility operator in consultation with the Resident Engineer. This temporary pavement shall be maintained, at no additional cost, until permanent replacement of roadway is installed as specified in contract.

D. <u>Method of Measurement</u>

The quantity to be measured for payment shall be the number of cubic yards (C.Y.) of material actually excavated and removed in order to facilitate the installation and/or removal of the utility structure and as directed by the facility operator in consultation with the Resident Engineer. The volume occupied by existing pipes, conduits and cables in the excavation will not be deducted from the total volume measured.

E. Price to Cover

The unit price bid shall cover the cost of all labor, materials, equipment, insurance, and incidentals necessary to excavate and prepare area in order to install and/or remove utility structures. The unit price shall also include the cost to completely expose, protect and maintain the integrity of existing facilities without disruption of service to utility customers and in accordance with applicable contract documents. The unit price shall also include, associated maintenance of traffic, and traffic plates and openings and closings of plates as may be required in order to provide access to excavation, and installing, removing and maintaining tight sheeting that may be required, cut, break and remove various thickness of surface and base pavement, of various types, excavate by hand to expose existing structures, furnish, place and compact backfill after installation and/or removal of the utility structure. Any required removing, trucking, storing, and disposing of all materials shall be deemed included in the unit price. Any additional furnishing, placing and compacting of backfill, and additional temporary pavement restoration, due to voids remaining, following the removing of an existing structure without the replacement of a new structure shall be covered under other applicable contract bid items. The unit price shall also include the cost of providing temporary pavement restoration. Permanent pavement restoration shall be paid under other contract items. The unit price shall also include the cost of locating and protecting all utilities facilities encountered, as required.

F. References

1. Applicable Utility Specifications

JB 410 – MASS EXCAVATION

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to mass excavate, while maintaining and protecting subsurface facilities, at locations approved by the Facility Operator in consultation with the Resident Engineer. The Contractor will encounter various underground facilities while performing the mass excavation and will be required to excavate over, under, adjacent to, around, in between and in close proximity of various congested configurations of multiple facilities. The facilities encountered may include but are not limited to:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Gas Facilities;
6. Steam Facilities;
7. Oil-o-static Facilities;
8. Water Mains;
9. Sewers;
10. Catch Basin Connections;
11. House Services;
12. Traffic Conduits;

The actual size to be mass excavated shall be determined based on test pit data and/or available utility records or other available documents and shall be performed in accordance with the contract plans (see mass excavation plan), specifications or as determined based on actual field conditions and at the direction of the Facility Operator in consultation with the Resident Engineer.

B. Materials

All materials used to mass excavate and prepare trenches and to support and maintain and protect existing facilities, similar to those indicated on Sketches JB 100 A and 100 A-1, shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

1 - Roadway Removal - Removal of the existing roadway pavement shall be completed prior to commencing with the mass excavation operation. The Removal of the existing roadway pavement shall be paid under other applicable City contract items, as required.

2 - Excavation - Once the roadway pavement is removed, the Contractor shall excavate by hand only or utilizing a combination of machine and hand excavation, if field conditions allow and if directed by the facility operator, in consultation with the Resident Engineer. Alternate methods and/or a combination of methods to mass excavate shall be permitted if proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer. The excavation may be adjusted based on field conditions as directed by the facility operator in consultation with the Resident Engineer. Excavation depth and size shall be determined in order to facilitate any required modification of utility facilities and in conformance with applicable specifications. Alterations to the Utility facilities that may be required, including but not limited to

horizontal and/or vertical utility facility adjustments, removal of various conduits and pipes and/or the installation of new utility conduits and/or pipes shall be paid for under other JB items and is not included in this item. Existing facilities that are encountered during mass excavating shall be supported and protected similar to those indicated on Sketches JB 100 A and 100 A-1 and in a manner acceptable to the facility operator in consultation with the Resident Engineer and are deemed included in this item. Excavations in the vicinity of utilities and other structures shall be performed using hand tools. The Contractor shall properly dispose of all materials excavated away from the job site.

Sheeting shall be used, as required, for excavation depths less than five feet, based on field conditions and as directed by the facility operator in consultation with the Resident Engineer. Sheeting shall be installed for all excavation depths that are equal to or greater than five feet. The sheeting required shall be furnished and installed in full compliance with State of New York and Federal Safety Code requirements and in compliance with applicable specifications and as directed by the facility operator in consultation with the Resident Engineer.

Contractor shall excavate all material encountered necessary to fully expose the utility facilities, and as directed by the facility operator in consultation with the Resident Engineer. Care should be taken to avoid damage to existing utility facilities and structures, and to adjacent curbs, sidewalks, pavements and their foundations, and to avoid caving or sliding banks within the excavation.

Should it become necessary, as determined by the facility operator in consultation with the Resident Engineer, to enlarge any excavation in any dimension after sheeting has been placed, the Contractor shall remove portions of the sheeting, as necessary, enlarge the excavation as directed, and replace the sheeting without additional compensation for this work other than for the additional volume of material excavated.

3 – Maintenance of Mass Excavation – Mass Excavations shall be kept free of debris and water and be maintained by the Contractor. The Contractor shall provide adequate maintenance and protection for vehicular and pedestrian traffic and may be required to furnish and install steel plates and/or provide other means necessary to adequately protect the underground facilities from damage during the mass excavation operation. The Contractor shall provide access to the mass excavation to the facility operator(s) and specialty contractors as directed by the facility operator in consultation with the Resident Engineer. The Contractor, at no additional cost, may be required to temporarily remove all equipment, debris and workers, and relocate maintenance of traffic set-up including barricades, cones and other warning devices and install traffic plates and/or provide other means necessary in order to open the full width of street or any segment of the street or sidewalk to traffic, which may include but is not limited to full width decking, pontoons, recessed plating and/or other alternate methods proposed by the Contractor and approved by the facility operator(s) in consultation with the Resident Engineer, during working or non-working hours as required, based on DOT traffic stipulations or as directed by the governmental authority having jurisdiction and as directed by the Resident Engineer. The Contractor shall at no additional cost, relocate such barricades barrels, cones and other warning devices and remove steel plates, as required and when directed by the facility operator in consultation with the Resident Engineer. When others are performing work and the excavations are open, the Contractor shall provide complete and safe

access to the excavation as may be required, and shall provide construction barricades and maintain traffic at all times as shown and as directed by the facility operator in consultation with the Resident Engineer.

4 – Backfilling and Compaction - Upon completion of the work of the underground utility facilities, which may include but is not limited to modify, adjust, alter, remove, install, inspect and/or test, which may require the utilization of the facility operator's own forces or specialty contractors, the mass excavation may be backfilled in accordance with Contract requirements. The backfill material shall conform to contract specifications and based on the facility operator's specifications. Furnishing and installing backfill and compaction of the mass excavation shall be paid under other applicable City contract items, as required. Areas around gas mains and oil-o-static facilities shall be backfilled with type 3/8 clean sand backfill, as directed by the facility operator in consultation with the Resident Engineer and paid under item JB 303.

5 – Pavement and Sidewalk Restoration – Pavement and Sidewalk restoration of the mass excavation shall be paid under other applicable City contract items, as required.

D. Method of Measurement

1 – Quantity - The quantity to be measured for payment shall be the number of cubic yards (C.Y.) of mass excavation area actually excavated, measured from below the roadway base, as directed by the facility operator in consultation with the Resident Engineer. The volume occupied by existing pipes, including but not limited to conduits, cables, steel pipes, gas mains, steam mains or other structures encountered will not be deducted from the total volume measured for payment.

2 – Type – The unit type to be measured for payment is based on the average underground facility congestion as determined based on test pit data and/or available utility records or other available documents and found in the contract plans (see mass excavation plan), specifications and/or based on actual field conditions as determined by the facility operator in consultation with the Resident Engineer.

Note: Only one measurement type will be permitted for each designated mass excavation area

Type .1 = Mass excavation with an average area occupied by utilities having a volume up to and including 20% of the total excavated volume, with maximum depths, measured from the top of roadway, less than five feet.

Type .2 = Mass excavation with an average area occupied by utilities having a volume over 20%, up to and including 40% of the total excavated volume, with maximum depths, measured from the top of roadway, less than five feet.

Type .3 = Mass excavation with an average area occupied by utilities having a volume over 40%, up to and including 60% of the total excavated volume, with maximum depths, measured from the top of roadway, less than five feet.

Type .4 = Mass excavation with an average area occupied by utilities having a volume over 60%, up to and including 80% of the total excavated volume, with maximum depths, measured from the top of roadway, less than five feet.

Type .5 = Mass excavation with an average area occupied by utilities having a volume up to and including 20% of the total excavated volume, with maximum depths, measured from the top of roadway, equal to or greater than five feet.

Type .6 = Mass excavation with an average area occupied by utilities having a volume over 20%, up to and including 40% of the total excavated volume, with maximum depths, measured from the top of roadway, equal to or greater than five feet.

Type .7 = Mass excavation with an average area occupied by utilities having a volume over 40%, up to and including 60% of the total excavated volume, with maximum depths, measured from the top of roadway, equal to or greater than five feet.

Type .8 = Mass excavation with an average area occupied by utilities having a volume over 60%, up to and including 80% of the total excavated volume, with maximum depths, measured from the top of roadway, equal to or greater than five feet

E. Price to Cover

The unit price bid for the various mass excavation items shall include the cost of all labor, materials, equipment, insurance, and incidentals necessary to mass excavate and completely expose, support, protect and maintain the integrity of subsurface facilities without disruption of service to the general public, utility customers and in accordance with the Contract Documents. The price shall also include, associated maintenance and protection of pedestrian and vehicular traffic, and traffic plates and openings and closings of plates, and cones, barrels, arrow-boards, etc. and installing, shifting, moving and relocating cones, barrels, arrow-boards, etc. as may be required in order to provide access to excavations. The unit price shall also include full width decking, pontoons, recessed plating and/or other alternate methods proposed by the Contractor and approved by the facility operator(s) in consultation with the Resident Engineer, in order to provide partial and/or full width vehicular and/or pedestrian traffic access to the work site area, during working or non-working hours as required, based on DOT traffic stipulations or as directed by the governmental authority having jurisdiction and as directed by the facility operator in consultation with the Resident Engineer. The unit price shall also include any and all sheeting, including tight sheeting that may be required, and excavating by hand to expose existing structures. Any required removing, trucking, storing, and disposing of material shall be deemed included in the unit price bid. The unit price shall also include the cost of supporting and protecting all utilities encountered in the mass excavation area including slings and beams installed for utility supports, as required. The price bid shall also include alternate methods for mass excavating, which may include changes in equipment and special operations, and sequencing and the use of only all hand-held tools due to existing field conditions. Any and all Contractor method changes and operation modifications employed for mass excavation for Utility Facilities are deemed to be included in the price bid for this item.

The Removal of the existing roadway pavement, furnishing and installing backfill and compaction, and pavement and sidewalk restoration of the mass excavation shall be paid under other applicable City and/or JB contract items, as required.

F. References

1. Sketches JB 100A, A-1
2. NYS Industrial Code Rule 753
3. Item JB 303

JB 450 – CONSTRUCTION FIELD SUPPORT

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to provide construction field support, while maintaining and protecting surface and subsurface facilities, at various locations approved solely by the Facility Operator in consultation with the Resident Engineer. The Contractor shall encounter various surface and subsurface utility facilities while performing various construction field support operations, which may include but are not limited to working over, under, adjacent to, around, in between and in close proximity of:

1. Conduits;
2. Conductors;
3. Concrete Encased Conduit Banks;
4. Steel Pipes;
5. Gas Mains;
6. Steam Mains;
7. Oil-o-static Facilities;
8. Utility Structures and Covers

The actual construction field support operation to be performed by the Contractor shall be performed in accordance with the contract plans, specifications or as determined based on actual field conditions and at the sole discretion and direction of the facility operator in consultation with the Resident Engineer. This item shall apply to various field support operation tasks for which there are no other applicable contract Bid Items to cover the required work. This item will not apply and will not be paid when there are other applicable contract bid items available either partly or completely covering tasks described below as determined by the facility operator in consultation with the resident Engineer.

B. Materials

All materials used to provide construction field support shall be supplied by the Contractor and be approved by the facility operator in consultation with the Resident Engineer.

C. Methods of Construction

It is the intent of this item that the Contractor provides field support construction crews suffice to perform various item type tasks required as described below. The Contractor shall provide all labor and equipment necessary to perform the required task as described below under existing field conditions at various locations and at the sole discretion and direction of the facility operator in consultation with the Resident Engineer. The Contractor shall perform the necessary construction field support, while maintaining and protecting surface and subsurface facilities. The Contractor shall employ approved methods of operation, including the use of appropriate equipment and tools that will enable him to complete the field support operation work as described in the Item Type description below. Existing facilities that are encountered during the construction field support operation shall be supported and protected similar to those indicated on Sketches JB 100 A and 100 A-1 and in a manner suitable to the facility operator in consultation with the Resident Engineer and are deemed included in this item. The Contractor shall properly dispose of all materials excavated away from site, which may require the use of

hand held tools and equipment in order to ensure that the integrity of the underground utility facilities are not jeopardized. Care should be taken to avoid damage to existing utility facilities and structures, and to adjacent curbs, sidewalks, pavements and their foundations, and to avoid caving or sliding banks within excavations.

D. Method of Measurement

1 – Quantity - The quantity to be measured for payment shall be the number of actual crew hours (Crhrs.) provided by the Contractor for performing the various types of construction field support operation as directed by the facility operator in consultation with the Resident Engineer.

2 – Type – The unit type to be measured for payment shall be based on the actual task performed by the contractor and covered by the applicable Item Type. The tasks described within the Bid Item Type below are provided as a guide only as to the general nature of the various functions included, but these examples in no way limit the use of the item to these functions only. The contractor should use this information in order to approximate the various required crew sizes necessary to perform the work covered by this item in a productive, safe and efficient manner. The actual construction crew size required to perform the field support operation shall be determined solely by the contractor in order to perform the required construction field support operation. It is the responsibility of the contractor to provide appropriate field support crews capable of performing required tasks in a productive, safe and efficient manner. The actual crew performing the operation will not be considered by the facility operator, in consultation with the Resident Engineer, when determining the applicable Unit Item Type, which shall be only as per the task performed.

Note: Only one measurement type will be used for each defined construction field support area.

Type .1 = Construction Field Support requiring an average size Survey Crew that will perform typical field survey functions and provide quality data analysis reports.

Type .2 = Construction Field Support requiring an average small size crew capable of performing various tasks, which may include but are not limited to: opening/closing subsurface structure cover(s), setting/resetting MPT setup(s), assisting Utility Facility/Specialty crew(s), performing conduit occupancy identification, clean-up storage work-site area, etc.

Type .3 = Construction Field Support requiring an average medium size crew capable of performing various tasks, which may include but are not limited to: excavations due to cable failures, including emergency type excavations, construct manhole enclosures, installing support system for utility facilities, dewatering utility structures and excavations, opening/closing traffic and/or pedestrian plates, etc.

E. Price to Cover

The unit price bid for the various construction field support items shall include the cost of all labor, materials, equipment, insurance, and incidentals necessary to provide construction field support, which may include but is not limited to working over, under, adjacent to, around, in between and in close proximity of surface and subsurface utility facilities and exposing, supporting, protecting and maintaining the integrity of the facilities without disruption of service to the general public, utility customers and in accordance with the Contract Documents at various locations approved by the Facility Operator in consultation with the Resident Engineer. The unit price shall also include, associated maintenance and protection of pedestrian and vehicular traffic, and traffic plates and openings and closings of plates, and cones, barrels, arrow-boards, etc. and installing, shifting, moving and relocating cones, barrels, arrow-boards, etc. as may be required in order to provide access to excavations and during specialty work being performed by others. The unit price shall also include excavating by hand to expose existing structures. Any required removing, trucking, storing, and disposing of material shall be deemed included in the unit price bid. The unit price shall also include the cost of supporting and protecting all utilities encountered during the construction field support operation, as required. The unit price bid shall also include alternate methods for construction field support, which may include changes in equipment and special operations, and sequencing and the use of only all hand-held tools due to existing field conditions, including potential delays and extended performance. Any and all Contractor method changes and operation modifications employed for construction field support are deemed to be included in the price bid for this item. Work under this item may be paid in combination with other City, utility or facility accommodation Items bid under other contract items.

F. References

1. Sketches JB 100A, A-1

JB 500 - REMOVAL OF ABANDONED UTILITY CONDUITS (NON-CONCRETE ENCASED)

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to remove all abandoned conduit(s), including but not limited to:

1. Conduit(s) (non-concrete encased).

The work shall include the breaking, removal and disposal of conduits (all types excluding steel pipes) and including backfilling with clean earth.

B. Materials

All materials including but not limited to clean backfill shall be supplied by Contractor and approved by the facility operator(s) in consultation with the Resident Engineer.

C. Methods of Construction

The facility operator(s) shall identify the locations of utilities that are abandoned within the contract area that are to be removed under this item. The authorized field representative of the facility operator shall certify in a timely manner acceptable as to which facilities are abandoned. The Contractor shall remove and properly dispose of all conduit(s) material encountered and seal the existing abandoned conduit(s) openings.

D. Method of Measurement

The quantity to be measured for payment shall be the linear footage (L.F.) of total number of conduit(s) removed.

E. Price to Cover

The unit price bid shall cover the cost of all labor, material, equipment, insurance and incidentals necessary to remove the abandoned conduit(s). The price shall also include the cost of removal and disposal of conduit(s); supplying clean earth material, backfilling with clean earth approved by the facility operator(s) in consultation with the Resident Engineer; sealing the existing abandoned conduit(s) openings; and all other items necessary to perform all work incidentals thereto.

F. References

None

JB 500.1 - REMOVAL OF ABANDONED PVC CABLE TELEVISION DUCT BANKS ATTACHED TO THE PAVEMENT BASE, CONCRETE ENCASED

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, and incidentals required to modify his work methods in order to remove all abandoned conduit(s), including but not limited to:

1. Concrete encased duct structure attached to the base pavement.

The work shall include the breaking, removal and disposal of PVC conduits, abandoned coaxial and fiber optic cable, and including backfill with clean earth and compaction.

B. Materials

All materials including but not limited to clean backfill shall be supplied by Contractor and approved by the Resident Engineer in consultation with the facility operator(s).

C. Methods of Construction

The facility operator(s) shall identify the locations of utilities that are abandoned within the contract area that are to be removed under this item. The authorized field representative of the facility operator shall certify in a timely manner acceptable to the Resident Engineer which facilities are abandoned. The Contractor shall remove and properly dispose of all conduit(s), concrete encasement and cable material encountered. A diagram of a typical duct bank is contained in JB Sketch 500.1.

D. Method of Measurement

The quantity to be measured for payment shall be the linear footage (L.F.) of total number of duct bank removed, up to and including 2 - 1 ¼" PVC ducts contained therein, and as per typical configuration of ducts and encasement as shown on JB Sketch 500.1.

E. Price to Cover

The unit price bid shall cover the incremental cost of all labor, material, equipment and incidentals necessary to remove the abandoned duct bank(s), as necessary and in the course of work under other contract items. The unit price shall also include the cost of removal and disposal of conduit(s); backfilling with clean earth approved by the Resident Engineer in consultation with the facility operator(s); insurance; sealing the existing abandoned conduit(s) openings, as necessary; clean earth fill; compaction, and all other items necessary to perform all work incidental thereto.

F. Reference

1. Sketch JB 500.1

JB 501 - REMOVAL OF ABANDONED MASONRY FOR UTILITY FACILITIES

A. Description

Under this Section the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to remove all abandoned plain or reinforced concrete and/or masonry including but not limited to:

1. Abandoned Utility Manholes and Service Boxes;
2. Concrete (Fully or Partially Encased) Conduit Banks
3. Abandoned Structures

The work shall include the breaking, removal and disposal of plain or reinforced masonry, and including backfill with clean earth.

B. Materials

All material shall be supplied by the contractor including but not limited to clean backfill to fill voids and shall be approved by the facility operator(s) in consultation with the Resident Engineer.

C. Methods of Construction

Within trench areas excavated under other items, the facility operator(s) shall identify the locations of abandoned utilities that are to be removed under this item. The authorized field representative of the Facility Operator shall certify in a timely manner which facilities are abandoned. The Contractor shall remove and properly dispose of all material encountered and seal the existing abandoned conduit(s) openings.

D. Method of Measurement

The quantity to be measured for payment shall be the actual volume of plain or reinforced concrete and/or masonry removed measured in Cubic Yards (C.Y.). No deduction will be made for conduit(s) openings in concrete encased conduit lines.

E. Price to Cover

The unit price bid shall cover the cost of all labor, material, equipment, and incidentals necessary to remove the abandoned masonry and/or concrete without disruption of service to the customers and in accordance with contract documents. The unit price bid shall also include the cost: of removal and disposal of all materials, supplying clean earth material, backfilling with clean earth, sealing the existing abandoned conduit openings in manholes and structures if required; and all other items necessary to perform all work incidental thereto.

F. References

None

JB 501.1 - REMOVAL OF ABANDONED CABLE TELEVISION SIDEWALK PULL BOXES

A. Description

Under this Section the Contractor shall provide all labor, materials, equipment and incidentals required to remove all abandoned cable television pull boxes including but not limited to:

1. Abandoned pull box boxes, frames and covers and
2. Sealing the existing abandoned conduit openings, as necessary.

The work shall include the breaking of sidewalk, temporary restoration of pavement (as necessary), removal and disposal of the pull box and related hardware, and including backfill with clean earth and compaction.

B. Materials

Clean backfill to fill voids shall be supplied by the Contractor and approved by the Resident Engineer in consultation with the facility operator(s).

C. Methods of Construction

The facility operator(s) shall identify the locations of pull boxes abandoned within the contract limits that are to be removed under this item. The authorized field representative of the Facility Operator shall certify in a timely manner acceptable to the Resident Engineer which facilities are abandoned. The Contractor shall remove and properly dispose of all material encountered. A diagram of a typical cable television pull box is contained in JB Sketch 501.1.

D. Method of Measurement

The quantity to be measured for payment shall be the number of pull boxes each (EA) to be removed and disposed of.

E. Price to Cover

The unit price bid shall cover the incremental cost of all labor, material, equipment, and incidentals necessary to remove the abandoned pull box and/or surrounding sidewalk and in accordance with contract documents, as necessary and in the course of work under other contract items. The unit price bid shall also include the cost: of removal and disposal of all materials, backfilling with clean earth, temporary restoration of pavement (as necessary), approved by the Resident Engineer in consultation with the facility operator(s) sealing the existing abandoned conduit openings in manholes if required; and all other items necessary to perform all work incidental thereto.

F. References

1. Sketch JB 501.1

JB 501.2 - ADJUSTMENT OF CABLE TELEVISION SIDEWALK PULL BOXES

A. Description

Under this Section the Contractor shall provide all labor, materials, equipment and incidentals required to modify his work methods in order to adjust cable television pull boxes including but not limited to:

1. Adjustment of existing modular, one-piece pull boxes, frames and covers, located in the sidewalk;
2. Maintenance of existing active cables and facilities, as per the Facility Operator.

The work shall include the breaking of sidewalk; maintenance and protection of traffic; excavation; support and maintenance of the existing pull box, cables and related hardware during excavation; relocation of existing pull boxes not to exceed six feet horizontally; vertical adjustment of the entire box to proposed grades; reconnection of attached ducts; furnish and install any incidental industry-standard hardware **such as couplings, connectors, caps, sleeves, bends, etc. for re-attaching existing ducts to the box;** disposal of any incidental debris or hardware; backfill with clean earth and compaction; temporary restoration of pavement (as necessary). Adjustment and realignment of attached ducts shall be paid under separate JB items 401, 402 and 403.

B. Materials

Clean backfill and any incidental hardware or material shall be supplied by the Contractor and approved by the Facility Operator in consultation with the Resident Engineer.

C. Methods of Construction

The facility operator shall identify the locations of pull boxes to be relocated within the contract limits under this item. The authorized field representative of the Facility Operator shall certify in a timely manner acceptable to the Resident Engineer, which facilities are to be relocated. The Contractor shall remove and properly dispose of all extraneous material encountered. A diagram of typical cable television pull boxes is contained in JB Sketch 501.1.

D. Method of Measurement

The quantity to be measured for payment shall be the number of pull boxes each (EA) to be relocated.

E. Price to Cover

The unit price bid shall cover the incremental cost of all labor, material, equipment, and incidentals necessary to adjust the pull box and restore surrounding pavement or sidewalk without disruption of service to the customers and in accordance with contract documents, as necessary and in the course of work under other contract items. The unit price bid shall also include the cost of: insurance; adjusting the location of the pull box; excavation; maintenance and protection of traffic; maintenance and support of the box and related facilities and cables; removal and disposal of all materials, backfilling with clean earth approved by the Resident Engineer in consultation with the facility operator(s); and all other incidentals necessary to perform all work incidental thereto.

F. References

1. JB 401
2. JB 402
3. JB 403
4. Sketch JB 501.1

JB 603E - INSTALL UTILITY CONDUIT

A. Description

Under this Section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to install utility conduit(s), excluding telecommunication conduits.

B. Materials

The Contractor shall supply all material (Mortar, Brick, etc.) to make repairs to opening(s) as approved by the facility operator in consultation with the Resident Engineer. All conduit(s) including sleeves, couplings, pulling lines, etc. shall be supplied to the Contractor's requested location by the facility operator for work under this item.

C. Method of Construction

The Contractor shall install conduit(s), as shown on sketches JB 603E.1, .2, .3, .4, from designated facility operator service points and/or structures to other facility structures, City-owned boxes, street light and traffic light foundations, install said conduit, rod, mandrel and wire the new conduit(s) and (install pulling lines) in accordance with the contract plans and specifications. When conduit pipes are to be connected to existing underground ducts, manholes, or boxes, the Contractor, using hand-held tools only, shall cut existing conduit, to pick-up existing underground conduits with new conduits, make openings into manholes or boxes, install/connect the conduit, and make repairs to seal the openings in the structure. The work shall be performed in accordance with the contract plans, specifications, and at the direction of the facility operator in consultation with the Resident Engineer.

Conduits that require concrete encasement shall be encased in 3200-PSI concrete to two (2) inches outside the limits of the conduit bank. Encasement shall overlap a minimum of two (2) feet beyond the adapter, as required.

If due to subsurface conditions, the cover is less than 20" from finished grade, the conduits shall be protected with steel plates furnished by the facility operator and measured for payment under Item JB-403.

D. Method of Measurement

The quantity to be measured for payment shall be the number of total linear feet (LF) of 2", 4" and/or 5" conduit(s) installed of various types, sizes and configurations.

JB 603E.1 Conduits Placed in Final Position without Concrete Encasement. (L.F.)

JB 603E.2 Conduits Placed in Final Position with Concrete Encasement. (L.F.)

E. Price to Cover

The unit price bid per linear foot of conduit(s) installed with or without concrete encasement shall cover the cost of all labor, materials, equipment, insurance and incidentals necessary to unload, store, handle, install, rod, mandrel, wire and perform any other associated work required to install the conduit(s) completely in place. Where conduits are to be connected to ducts, manholes or boxes, the cost of cutting existing conduit, to pick-up existing underground conduits with new conduits, make openings into manholes or boxes, installing and sealing the conduit; furnishing and installing forms and concrete encasement, removing forms and making repairs to the openings in the structure, all associated maintenance and support of traffic shall be considered as included in the unit price bid for the installation of the conduit(s).

Work under these items may be paid in combination with other City utility or facility accommodation items paid under other contract bid items.

F. References

1. Sketches JB 603E.1, JB 603E.2, JB 603E.3, JB 603E.4
2. Item JB 403

JB 603T - INSTALL TELECOMMUNICATIONS CONDUIT

A. Description

Under this Section, the Contractor shall provide all labor, materials, equipment, insurance, and incidentals required to procure and install conduit for the purpose of installing the facility operator's utilities. Conduit runs shall be as shown on the contract drawings or as specified by the facility operator in consultation with the Resident Engineer.

B. Materials

Conduit shall consist of:

PVC – 2" and 4" diameter or 1 ¼" Quad, Type "C" as supplied by American Pipe and Plastics or approved equal.

Steel - 4" diameter, ASTM A53, Schedule 40 or approved equal.

All conduit including sleeves, couplings, bends, pulling lines, etc. shall be supplied by the Contractor and approved by the facility operator in consultation with the Resident Engineer.

The Contractor shall supply all material (Mortar, Brick, etc.) to make repairs to opening(s) as approved by the facility operator in consultation with the Resident Engineer.

C. Method of Construction

The Contractor shall install the specified conduit(s), then rod, mandrel and wire (install pulling line) the new conduits. When conduit pipes are to be connected to existing underground ducts, manholes, or boxes, the Contractor, using hand-held tools only, shall cut existing conduit, to pick-up existing underground conduits with new conduits, make openings into manholes or boxes, install/connect the conduit, and make repairs to seal the openings in the structure.

Steel pipe shall be used for shallow cover and crossing or paralleling steam mains as directed by the facility operator in consultation with the Resident Engineer.

When the facility operator requires a combination of conduit types and materials the facility operator will define the configuration of the conduit system and the location of each type within the conduit bank. All conduit shall be spaced 1 ½" both vertically and horizontally from the adjacent conduit(s). All conduits shall be encased in lean concrete (f'c = 1200 to 1500 psi maximum), which shall extend 2" beyond each face of the conduit formation, above and each side of the conduit formation.

The work shall be performed in accordance with the contract plans, specifications, and at the directions of the facility operator in consultation with the Resident Engineer.

D. Methods of Measurement

The quantity to be measured for payment shall be the number of linear feet (LF) of conduit trench for which conduit was installed:

1. JB 603T.1 - Install 1 ea. 2", 4" or 1 ¼" Quad" Conduit (PVC or Steel) in any combination
2. JB 603T.2 - Install 2 ea. 2", 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
3. JB 603T.3 - Install 4 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
4. JB 603T.4 - Install 6 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
5. JB 603T.5 - Install 8 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
6. JB 603T.6 - Install 12 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
7. JB 603T.7 - Install 15 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
8. JB 603T.8 - Install 24 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination
9. JB 603T.9 - Install 30 ea. 4" or 1 ¼" Quad Conduits (PVC or Steel) in any combination

A Quad, consisting of four 1 ¼" conduits shall be supplied as one unit. For purposes of measurement and payment each quad unit of four 1 ¼" ducts shall be counted as one duct.

For any equivalent combination not fitting the above categories payment shall be based on the next higher category.

E. Price to Cover

The unit price per linear foot of Conduit trench shall cover the cost of all labor, materials, equipment, insurance and incidentals necessary to, install, rod, rope, and perform any other associated work required to install the conduit completely in place. Where conduits are to be connected to ducts, manholes or boxes, the cost of cutting and/or breaking into the ducts, manholes or boxes, installing and sealing the conduit, including duct plugs; and making repairs to the openings in the structure shall be considered as included in the unit price bid for the installation of the conduit. All acceptance testing, including passing a mandrill with a diameter of 1/8" less than the inside diameter of the duct through the entire length of the duct, as required by the facility operator shall be considered as included in the unit price.

Payment for trench excavation shall be paid under Item 405.

F. References

1. Sketches JB 603.1
2. Item 405
3. American Pipe and Plastics, P.O. Box 577, Binghamton, N.Y. 13902

JB 636 E - ADJUSTMENT OF UTILITY HARDWARE

This section describes the work of adjusting existing utility manholes, street hardware including vaults, etc., and valve boxes to the proposed grade by either building up or lowering the installation and resetting the castings, as and where directed by the facility operator in consultation with the Resident Engineer.

A. Description

Building up or lowering the installation and resetting the castings shall consist of removing the existing frame and cover, building up or decreasing the existing installation, replacing the frame and/or cover if damaged, as determined by the facility operator, with a new frame and/or cover furnished by the facility operator, and setting the frame and cover to the new elevation.

B. Materials

All materials used to adjust utility hardware shall be supplied by the Contractor and approved by the facility operator in consultation with the Resident Engineer.

Materials used shall comply with the standards of the facility operator having jurisdiction over the installations. The facility operator shall furnish new castings of the various sizes required and deemed by the facility operator to be replaced to the Contractor. The Contractor shall be required to inform the Utility in advance of the need for the castings. Materials supplied by the facility operator shall be delivered to the Contractor's designated storage area. The Contractor shall notify the facility operator(s) of the installation schedule at least five days before such materials are required on the site. All materials supplied by the facility operator(s) shall be delivered to the Contractor's requested location. The Contractor shall be responsible to unload, handle, store, deliver and/or distribute the material supplied by the facility operator(s) to the required job location(s) for the duration of the contract. It shall also be the Contractor's responsibility to inspect and verify upon delivery that the correct quantity of material that has been delivered and to advise the facility operator(s), through its authorized representative, of all damaged material. The Contractor at no additional expense to the facility operator(s) shall replace any material that is damaged or lost after the Contractor's inspection and acceptance.

C. Methods of Construction

The Contractor shall breakout and dispose of sidewalk, curb, pavement and/or pavement base around existing casting, excavate as required to remove casting and install existing or replacement casting, remove casting, protect opening, reinstall existing casting or install new casting to the proposed grades, backfill, grade and compact fill around casting, install base concrete and or sidewalk pavement and curb, tack coat around frame, install and remove temporary pavement around casting where directed by the facility operator; and install and compact asphalt binder and wearing course or other permanent pavement around casting and perform all work in accordance with the contract plans and the specifications.

Setting or resetting the castings shall be done with bricks plus mortar and/or by raising or lowering adjustable castings according to the standards of the utility owner having jurisdiction over the installation. Work shall be done in a workmanlike manner. Any damage resulting from the Contractor's operations to the existing installation which is to remain shall be satisfactorily corrected at the Contractor's own expense, as directed by the facility operator in consultation with the Resident Engineer. Castings, which are deemed unacceptable for resetting, shall become the property of the Contractor and shall be removed and disposed of by him away from the site.

No traffic shall be allowed on adjusted utility hardware until permitted by the facility operator in consultation with the Resident Engineer.

D. Method of Measurement

The quantity to be measured for payment shall be the number of utility hardware units (EA) in each size group actually adjusted as specified under each item. The size of each utility hardware unit, measured in width, shall be defined as the diameter of circular covers, the major axis of elliptical covers, or the larger length or width of rectangular covers.

1. Item JB 636 EA - Adjustment of Utility Hardware (Under 7" Width)
2. Item JB 636 EB - Adjustment of Utility Hardware (7" to under 14" Width)
3. Item JB 636 EC - Adjustment of Utility Hardware (14" to under 30" Width)
4. Item JB 636 ED - Adjustment of Utility Hardware (30" to under 34" Width)
5. Item JB 636 EE – Adjustment of Utility Hardware (34" to under 41" Width)
6. Item JB 636 EG - Adjustment of Utility Hardware (41" to under 75" Width)
7. Item JB 636 EH - Adjustment of Utility Hardware (75" to under 125" Width)
8. Item JB 636 EI - Adjustment of Utility Hardware (125" to under 170" Width)

E. Price to Cover

The unit price bid for regrading the various types of utility hardware shall be the unit price per each and shall cover the cost of furnishing all labor, materials, plant, equipment, maintenance and protection of traffic, and incidentals required to remove existing frames and covers; build up the existing installations with brick and mortar, or lower the existing installations by removing bricks and mortar; replace damaged frames and/or covers with frames and/or covers furnished by others; break out pavement and/or pavement base; protect existing opening and installation; set the frames and covers to new elevations; grade and compact fill; install base concrete; tack coat frame; install, remove, and dispose of temporary pavement; install and compact asphalt binder and wearing course or other permanent pavement; repair minor structural damage to existing installations prior to resetting frames; unloading of furnished castings at the Contractor's yard and transporting castings from the Contractor's yard to the job site as required; and complete the work in accordance with the plans, the specifications, and the directions of the facility operator in consultation with the Resident Engineer. The price shall also include the use of high early type concrete, based on existing field conditions or as necessary to meet City contract requirements.

F. References

1. NYS DOT Standard Specs for Class F. Concrete

JB 636 R - REPAIR TO UTILITY STRUCTURES

This section describes the work of performing the necessary repairs to utility structures by repairing the existing structures using methods approved by the facility operator in consultation with the Resident Engineer.

A. Description

Repairs of utility structures, which include boxes, manholes, vaults and valve boxes, shall consist of removing the existing frame and cover followed by repairing the existing walls, floors, and roof as directed by the facility operator in consultation with the Resident Engineer. Repairs shall include removing and repairing spalled and loose concrete, removing and replacing or resetting loose bricks, and repairing of damaged surfaces in the area where the chimney or street hardware frame rests on the privately owned utility structure, and similar repairs as directed by the facility operator in consultation with the Resident Engineer.

B. Materials

All materials used shall comply with the standards of the facility operator.

C. Methods of Construction

All work shall comply with the specifications, plans, and standards of the facility operator. The Contractor shall perform the necessary repairs to the floor, walls and roof of the existing utility structure as directed by the facility operator in consultation with the Resident Engineer. No traffic shall be allowed on repaired structures until permitted by the facility operator in consultation with the Resident Engineer.

Adjusting existing or new frames and covers shall be as described in Section JB 636E.

All work shall be done in a workmanlike manner and any damage resulting from the Contractor's operations shall be satisfactorily corrected as directed by the facility operator in consultation with the Resident Engineer and at the Contractor's expense.

D. Method of Measurement

The quantity to be measured for payment shall be the number of cubic yards (CY) of concrete and brick and mortar in place to the nearest hundredth of a cubic yard. No deductions will be made for the spaces occupied by steel reinforcement.

E. Price to Cover

The unit price bid under this item shall be a unit price per cubic yard (CY) of concrete, brick, and mortar placed in the utility structure. The unit price shall cover the cost of all labor, materials, plant, equipment, insurance, maintenance and protection of traffic, and incidentals required to repair utility structures including all pavement breaking, pavement removal and disposal, excavation, haul away, and disposal, furnish and install and compact backfill, and removal of frame and cover. The unit price shall also include removal of all damaged, spalled and loose concrete, bricks, and mortar, formwork, installation of concrete, bricks, and mortar, support and protection of all utility facilities within the structure, and the furnishing of samples, as required. All work shall comply with the plans, specifications, standards and directions of the facility operator. Resetting of new or existing street hardware shall be paid under the appropriate JB 636E item.

F. References

1. JB 636E

JB 636 S–ADJUSTMENT OF UTILITY STEAM HARDWARE

This section describes the adjustment of existing utility steam castings requiring a concrete collar and the installation of a concrete collar around the adjusted steam castings.

A. Description

Building up or lowering the installation and resetting the steam castings shall consist of removing the existing frame and cover, building up or decreasing the existing installation, replacing the frame and/or cover if damaged, as determined by the facility operator in consultation with the Resident Engineer, with a new frame and/or cover furnished by the facility operator, setting the frame and cover to the new elevation and placing a concrete collar around the steam casting all in accordance with the plans, the specifications, and the directions of the facility operator in consultation with the Resident Engineer.

B. Materials

Concrete for collar shall comply with the requirement of Section 3.05, Class A-40, Type IIA; Cement shall be Type II Portland; Sand - Type 1A; coarse aggregate - Type 1, Grade B or Type 2, Size No. 57. An approved air-entraining agent shall be added at the time concrete ingredients are mixed with water.

Reinforcement shall be welded steel wire fabric complying with the requirements of ASTM Designation A185, with wire spacing and sizes shown on the plans.

Material used for vertical adjustment of castings shall comply with the standards of the facility operator having jurisdiction over the installations.

New steam castings of the various sizes required and deemed by the facility operator to be replaced shall be furnished to the Contractor. The Contractor shall be required to inform the facility operator in consultation with the Resident Engineer in advance of the need for the castings. Materials supplied by the facility operator shall be delivered to the Contractor's designated storage area.

C. Method of Construction

The Contractor shall breakout pavement and/or pavement base around existing casting, remove casting, protect opening, reinstall existing castings or install new castings to the proposed grades, grade and compact fill around casting, install concrete collar around casting, tack coat around frame, install and remove temporary pavement around casting when required and perform all work in accordance with the contract plans and the specifications.

Setting or resetting the castings shall be done with brick and mortar according to the standards of the facility operator having jurisdiction over the installation. Work shall be done in a workmanlike manner. Any damage resulting from the Contractor's operations to the existing installation which is to remain shall be satisfactorily corrected at the Contractor's own expense, as directed by the facility operator in consultation with the Resident Engineer.
Castings, which are deemed unacceptable for resetting, shall become the property of the Contractor and shall be removed and disposed of away from the site.

Placement of reinforced concrete to form a collar around the steam castings shall be done in accordance with the details shown on the plans, Sections 4.05.4, 4.05.5, and 4.05.6 of the Standard Highway Specifications, and the directions of the Resident Engineer.

No traffic shall be allowed on adjusted street hardware until permitted by the facility operator in consultation with the Resident Engineer.

During the course of adjusting or replacing castings, the Engineer may direct the Contractor to perform minor structural repairs to any damaged utility structures prior to resetting the castings and that work shall be done and paid for in accordance with other items.

D. Method of Measurement

1. JB 636 SA

The quantity of concrete collars around steam castings to be measured for payment shall be the number of square feet (SF) of concrete collar constructed, measured in place, adjusted for thickness and strength deficiencies in accordance with Section 1.05.4. In determining the quantity of area to be paid, the areas occupied by castings will be deducted when they measure more than one (1) square foot and will not be deducted when they measure one (1) square foot or less. Also, the area of concrete haunch to be paved over with 3" asphalt concrete pavement shall be included in the area of measurement for the concrete collar.

2. JB 636 SB and SC

The quantity of adjusted steam castings to be measured for payment shall be the actual number (ea) of steam castings requiring a concrete collar that are adjusted to the proposed roadway grade. The size of each street hardware unit, measured in width, shall be defined as either the diameter of circular covers or the larger length or width of rectangular covers.

E. Price to Cover

1. Item JB 636 SA - The unit price bid for Item JB 636 SA per square foot (SF) of Concrete Collar Around Steam Castings shall cover the cost of furnishing all labor, materials, plant, equipment, maintenance and protection of traffic, insurance and incidentals required to complete the work, including furnishing and placing reinforced concrete, inclusive of steel, supports, curing, etc., to furnish such samples for testing and to provide such testing laboratory space and facilities as may be required and to maintain the collar in good conditions as specified in Section 1.05.5., and completing the work in accordance with the plans, the specifications and the directions of the facility operator in consultation with the Resident Engineer.

2. Items JB 636 SB and JB 636 SC

The unit contract price bid for:

1. Item JB 636 SB - Adjustment of Utility Steam Castings (Under and including 8" Width)
2. Item JB 636 SC - Adjustment of Utility Steam Castings (Above 8" to 34" Width)

shall cover the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to remove existing frames and covers; build up the existing installations with brick and mortar, or lower the existing installations by removing bricks and mortar; replace damaged frames and/or covers with frames and/or covers furnished by others; break out pavement and/or pavement base; protect existing opening and installation; set the frames and covers to new elevations; grade and compact fill; install base concrete; tack coat frame; install and remove temporary pavement; repair minor structural damage to existing installations prior to resetting frames; unloading of furnished castings at the contractor's yard and transporting castings from the contractor's yard to the job site as required; and complete the work in accordance with the plans, the specifications, and the directions of the facility operator in consultation with the Resident Engineer.

The price shall also include the use of high early type concrete, based on existing field conditions or as necessary to meet City contract requirements.

Adjustment of steam castings not requiring concrete collars shall be paid for under the appropriate JB 636 E item.

F. <u>References</u>

1. ASTM A185
2. JB 636 E

JB 638N – INSTALLATION OF FIELD CONSTRUCTED UTILITY STRUCTURE

This section describes the work of performing the installation of field constructed utility structures approved by the facility operator in consultation with the Resident Engineer. The utility structure shall be field constructed and installed in compliance with standard utility specifications and/or methods approved by the facility operator in consultation with the Resident Engineer.

A. Description

Installation of field constructed utility structure shall comply with utility standard specification and/or as directed by the facility operator in consultation with the Resident Engineer and shall include:

- Service Boxes (various sizes)
- Manholes (various sizes)
- Vaults (various sizes)
- Valve Boxes (various sizes)

B. Materials

All materials used shall be supplied by the Contractor and comply with the standards of the facility operator. Where applicable, the Contractor shall obtain pre-cast roofs that are available from the facility operator's vendor.

C. Method of Construction

All work shall comply with the utility specifications, plans, and standards of the facility operator.

The Contractor shall perform the necessary field construction of the floor, walls, and roof of the utility structure as directed by the facility operator in consultation with the Resident Engineer. New roof slabs shall be monolithic or non-monolithic as directed by the facility operator in consultation with the Resident Engineer. New non-monolithic roofs shall be removable and cast on site or pre-cast as directed by the facility operator. No traffic shall be allowed on the structure until permitted by the facility operator in consultation with the Resident Engineer.

Field conditions may require the Contractor to modify the standard specifications of the floor, walls and roof of the utility structure, as directed by the facility operator in consultation with the Resident Engineer.

Refer to specification JB 636E for guideline relating to the installation of new frames and covers.

All work shall be done in a workmanlike manner and any damage resulting from the Contractor's operations shall be satisfactorily corrected as directed by the facility operator in consultation with the Resident Engineer and at the Contractor's expense. The Contractor shall perform the installation of the utility structure while maintaining, supporting, and protecting and accommodating the integrity of all utility facilities (without disruption of service) located within the areas of the excavation and the field constructed structure.

This item shall also apply when partially or totally rebuilding or modifying an existing utility structure.

D: Method of Measurement

The quantity to be measured for payment shall be the number of cubic yards (CY) of concrete, cast on site concrete, brick, and mortar in place to the nearest hundredth of a cubic yard. No deductions will be made for the spaces occupied by steel reinforcement.

E. Price to Cover

The unit price bid under this item shall be a unit price per cubic yard (CY) of concrete, cast on site concrete; brick and mortar placed in the field constructed utility structure. The unit price shall cover the cost of all labor, materials, plant, equipment, insurance; maintenance and protection of traffic and incidentals required to field construct partially or totally, rebuild or modify, a privately owned utility structure. The unit price shall also include all formwork, installation of concrete, bricks, mortar, steel reinforcement, structural steel beams, furnish and install pre-cast roofs, chimney, and installation of interior hardware and exterior hardware, including frames and covers. The unit price shall further include the cost of maintaining, supporting, protecting and accommodating the integrity of all utility facilities (without disruption of service) during the work within the areas of excavation and the field constructed structure, and the furnishing of samples, as required. All work shall comply with the plans, specifications, standards, and directions of the facility operator in consultation with the Resident Engineer.

Demolition of the existing utility structure, including haul away and disposal of demolished materials and any formwork, concrete, bricks, mortar, steel reinforcement, structural steel beams, interior hardware, exterior hardware and frames and covers shall be paid under item JB 638R, if required.

All pavement breaking, pavement removal and disposal, excavation, haul away, and disposal, furnish and install backfill, temporary pavement, sheeting, bracing, and all necessary incidentals shall be paid under item JB 406, only if required.

F. References

1. JB 406
2. JB 636E
3. JB 638R
4. Utility Specification Drawings

JB 638NT – INSTALLATION OF FIELD CONSTRUCTED TELEPHONE UTILITY STRUCTURE

This section describes the work of performing the installation of field constructed utility structures approved by the facility operator in consultation with the Resident Engineer. The utility structure shall be field constructed and installed in compliance with standard utility specifications and/or methods approved by the facility operator in consultation with the Resident Engineer.

A. Description

Installation of field constructed utility structure shall comply with utility standard specification and/or as directed by the facility operator in consultation with the Resident Engineer and shall include:

- Service Boxes (various sizes)
- Manholes (various sizes)
- Vaults (various sizes)
- Valve Boxes (various sizes)

B. Materials

All materials used shall be supplied by the contractor and comply with the standards of the facility operator. Where applicable, the Contractor shall obtain pre-cast roofs that are available from the facility operator's vendor.

F. Method of Construction

All work shall comply with the utility specifications, plans, and standards of the facility operator.

The Contractor shall perform the necessary field construction of the floor, walls, and roof of the utility structure as directed by the facility operator in consultation with the Resident Engineer. New roof slabs shall be monolithic or non-monolithic as directed by the facility operator in consultation with the Resident Engineer. New non-monolithic roofs shall be removable and cast on site or pre-cast as directed by the facility operator. No traffic shall be allowed on the structure until permitted by the facility operator in consultation with the Resident Engineer.

Field conditions may require the contractor to modify the standard specifications of the floor, walls and roof of the utility structure, as directed by the facility operator in consultation with the Resident Engineer.

Refer to specification JB 636E for guideline relating to the installation of new frames and covers.

All work shall be done in a workmanlike manner and any damage resulting from the Contractor's operations shall be satisfactorily corrected as directed by the facility operator in consultation with the Resident Engineer and at the Contractor's expense. The contractor shall perform the installation of the utility structure while maintaining, supporting, and protecting and accommodating the integrity of all utility facilities (without disruption of service) located within the areas of the excavation and the field constructed structure.

This item shall also apply when partially or totally rebuilding or modifying an existing utility structure.

G. Method of Measurement

The quantity to be measured for payment shall be the number of cubic yards (CY) of concrete, cast on site or pre-cast, as specified, concrete, brick, and mortar in place to the nearest hundredth of a cubic yard. No deductions will be made for the spaces occupied by steel reinforcement.

Type .1 = Pre-Cast Structure
Type .2 = Cast-In-Place Structure

H. Price to Cover

The contract price under this item shall be a unit price per cubic yard (CY) of concrete, cast on site or pre-cast, as specified, concrete, brick, and mortar placed in the field constructed utility structure. The unit price shall cover the cost of all labor, materials, plant, equipment, insurance; maintenance and protection of traffic and incidentals required to field construct partially or totally, rebuild or modify, a privately owned utility structure. The unit price shall also include all formwork, installation of concrete, bricks, mortar, steel reinforcement, structural steel beams, furnish and install pre-cast roofs, chimney, and installation of interior hardware and exterior hardware, including frames and covers. The unit price shall further include the cost of maintaining, supporting, protecting and accommodating the integrity of all utility facilities (without disruption of service) during the work within the areas of excavation and the field constructed structure, and the furnishing of samples, as required. All work shall comply with the plans, specifications, standards, and directions of the facility operator in consultation with the Resident Engineer.

All pavement breaking, pavement removal and disposal, excavation, haul away, and disposal, furnish and install backfill, temporary pavement, sheeting, bracing, and all necessary incidentals shall be paid under item JB 406, only if required.

F. References

1. JB 406
2. JB 636E
3. Utility Specification Drawings

JB 638R – BREAK OUT AND REMOVE UTILITY STRUCTURE

B. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals necessary to partially or totally break out and remove existing utility structures using methods approved by the facility operator in consultation with the Resident Engineer. Breaking out and removing existing utility structures shall be performed while maintaining and protecting all subsurface facilities, at locations approved by the Facility Operator in consultation with the Resident Engineer. The Contractor will encounter various underground facilities, located both inside and outside the utility structure, while partially or totally breaking out and removing existing utility structures and will be required to excavate and perform work over, under, adjacent to, around, in between and in close proximity of various congested configurations of multiple facilities, conduits, pipes and cables.

All work required to partially or totally break out and remove existing utility structures shall comply with standard utility specifications and/or as directed by the facility operator in consultation with the Resident Engineer and shall include but not be limited to:

- Service Boxes (various sizes)
- Manholes (various sizes)
- Vaults (various sizes)
- Valve Boxes (various sizes).

B. Materials

All materials used shall be supplied by the Contractor and comply with the standards of the facility operator.

C. Method of Construction

The Contractor shall perform the necessary breaking out and removal of the existing utility structure while maintaining and protecting all subsurface facilities. The Contractor will encounter various underground facilities located both inside and outside the utility structure, while partially or totally breaking out and removing existing utility structures and will be required to excavate and perform work over, under, adjacent to, around, in between and in close proximity of various congested configurations of multiple facilities, conduits, pipes and cables, as directed by the facility operator in consultation with the Resident Engineer. All work shall be done in a workmanlike manner and any damage resulting from the Contractor's operations shall be satisfactorily corrected as directed by the facility operator in consultation with the Resident Engineer and at the Contractor's expense.

This item shall also apply when partially or totally breaking out and removing an existing utility structure.

D. Method of Measurement

The quantity to be measured for payment shall be the number of cubic yards (CY) of concrete, reinforced concrete, brick, and mortar of the existing utility structure broken out, removed and disposed to the nearest hundredth of a cubic yard. No deductions will be made for the spaces occupied by steel reinforcement.

E. Price to Cover

The unit price bid under this item shall be a unit price per cubic yard (CY) of concrete, reinforced concrete, brick, and mortar of the existing utility structure broken out, removed and disposed. The unit price shall also cover the cost of all labor, materials, plant, equipment, insurance, maintenance and protection of traffic and incidentals required to partially or totally break out, remove and dispose of existing utility structure. The unit price shall also include demolition of the existing utility structure, haul away and disposal of demolished materials, formwork, concrete, bricks, mortar, steel reinforcement, structural steel beams, interior hardware, exterior hardware, including frames and covers. The unit price shall further include the cost of maintaining, supporting, protecting and accommodating the integrity of all utility facilities (without disruption of service) during the work within the areas of excavation and the existing structure. All work shall comply with the plans, specifications and standards, provided by and at the directions of the facility operator in consultation with the Resident Engineer.

All pavement breaking, pavement removal and disposal, excavation, haul away, and disposal, furnish and install backfill, temporary pavement, sheeting, bracing, and all necessary incidentals shall be paid under item JB 406, only if required.

F. References

1. JB 406

JB 700 - SPECIAL MODIFICATION OF WORK METHODS TO ACCOMMODATE/PROTECT UNDERGROUND FACILITIES WITH LIMITED COVER

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to modify work methods and maintain, protect and accommodate the integrity of utility facilities that include, but are not limited to:

1. Conduits;
2. Conductors;
3. Concrete encased Conduit banks;
4. Steel Pipes;
5. Oil-o-static Facilities; and
6. Non-cost Sharing Gas Facilities;
7. Underground Utility Structures

located within a zone beneath the existing pavement, base and/or sub-base. The zone shall be defined, for Utilities, as 12 inches of cover or less from the ultimate depth of excavation. The provisions of this item shall be applicable during the removal of existing and temporary pavement and other in-place material, backfilling or filling where required, grading, preparation of sub-grade, compacting, and installation of concrete base material and/or compatible sub-base material and temporary restoration material where applicable, required under other contract bid items. The work shall be performed in accordance with the contract plans (see special care excavation plan), specifications and at the directions of the facility operator(s) in consultation with the Resident Engineer.

B. Materials – N/A

C. Methods of Operation/Construction

Once the clearances have been verified by available records, to the sole satisfaction of the facility operator(s) in consultation with the Resident Engineer, the Contractor shall exercise extreme caution, by utilizing appropriate methods of operation/construction, by employing specialized construction equipment and special operations and sequencing, within the area designated for protection and accommodation of utility facilities as shown on the plans or where the cover on the aforementioned subject utilities is equal to or less than 12" inches measured from the ultimate depth of excavation, covered under other applicable contract bid items, and as directed by the facility operator(s) in consultation with the Resident Engineer. All work shall incorporate, but not be limited by the following restrictions:

1. Removal of Existing Pavement

   Removal of temporary and existing pavement, base material, and all in-place material shall be performed by cutting, undermining and lifting, or any combination thereof, with excavators working off or from adjacent undisturbed pavement. This method shall be used in lieu of using earth moving excavator equipment to remove the existing roadway and/or base material by lifting and/or pushing pavement, or any combination thereof, ahead of it while the equipment is supported and/or running on the exposed earth, sub-grade or sub-base. Alternate methods for Removal of Existing Pavement, which may include changes in equipment and special operations, and sequencing and the use of all hand-held tools, might

be required, based on existing field conditions. Such alternatives may be proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer. Approved changes for Removal of Existing Pavement are deemed to be included in the price bid for this item. All equipment and methods and maintenance and protection provisions shall require full authorization by the facility operator(s) in consultation with the Resident Engineer.

2. Preparation and Installation of New Pavement Base and Temporary Restoration Material

The backfilling, grading, and installation of base, compatible materials, (or other pavement material) in the areas designated within the specific zones of protection, shall be performed utilizing materials, equipment and methods of construction that will insure the integrity of the utility facilities which shall, for the purpose of this item, include the provision that the loading on the utilities including any impact loads, shall not be greater than a total of 4 kips, (1 kip = 1,000 pounds of unit weight), and at the same time meet all requirements for this work as specified in other sections of this contract. Alternate methods for preparing and installing the new pavement base and temporary restoration material, which may include, changes in equipment and special operations, and sequencing and the use of all hand held tools might be required, based on existing field conditions. Such alternatives may be proposed by the contractor and approved by the facility operator in consultation with the Resident Engineer. Approved changes in the Preparation and Installation of the New Pavement Base and Temporary Restoration Material are deemed to be included in the price bid for this item.

3. Compaction

The Contractor shall compact all sub-grade, new sub-base and temporary restoration material in the areas designated within the specified zones of protection by utilizing native and/or blended fill material, equipment and methods of construction that shall insure the integrity of the Utilities and at the same time meet all requirements for compaction as specified in other sections of this contract. Alternate methods for Compacting, which may include changes in equipment and special operations, and sequencing and the use of all hand-held tools, might be required, based on existing field conditions. Such alternatives may be proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer. Approved changes in Compacting are deemed to be included in the price bid for this item. The Contractor shall be required to initiate a test strip compaction operation in selected areas on site to verify the materials, procedures and equipment producing a sub-grade that is in compliance with contract specifications.

4. Powered Excavating Equipment Limitations

The Contractor shall not employ powered or mechanical excavating equipment over or closer than twelve inches in any direction from the staked, marked or otherwise designated or known, outside envelope or perimeter of said utilities unless permitted in writing. Such written permission shall be furnished to the excavator through the facility operator(s) in consultation with the Resident Engineer (where applicable) and only where the Contractor has provided certified documentation, by a New York State licensed Professional Engineer, that loading(s), including impact, on facilities due to his/her operations is not greater than that during normal

traffic conditions on the existing pavement. The Contractor shall not be permitted to store, stand and/or travel equipment/vehicles on specified unpaved zoned protection areas.

D. Method of Measurement

The quantity of Special Modification of Work Methods to Accommodate/Protect underground facilities with limited cover to be measured for payment shall be the number of cubic yards (C.Y.) of existing pavement and sub-grade material of whatever nature encountered, actually removed and disposed of from the existing roadway zone of protection area, measured in place between the top of existing surface and the ultimate depth of excavation necessary for the installation and or removal of pavement, and/or additional compatible material.

The horizontal zone of protection shall be defined, for the purpose of this item, as the boundary/area designated on the plans or a boundary/area 3 feet from the outer edge of each of the designated facilities, on a block-by-block basis based upon available records. Where overlapping of the zones occurs due to multiple facilities, the boundary/area shall be modified to one zone measured from the outside limits. Where the 3-foot area falls beyond the curb line, the outside boundary shall be the curb line. The areas measured for payment under this item shall be made for work related to the removal of existing pavement, all in-place material, and installation of new pavements and/or compatible materials within a designated zoned protection. Installation and removal of the temporary restoration material shall not be measured for payment under this item. Modifications to work methods required in areas in between zones of protection for multiple utility facilities adjacent to any existing structure/curb shall not be measured for payment and are deemed to be included in the price bid for this item.

E. Price to Cover

The unit price bid per cubic yard (C.Y.) for Special Modification of Work Methods, etc., shall include the cost of all incremental labor, materials, time, equipment, insurance and incidentals required for excavation and disposal of pavement and all other in-place materials, installation of concrete base material to new sub-grade, grading, preparation of sub-grades, hand excavation, backfilling, removal of temporary asphalt concrete mixture, and compaction; all together with necessary incidentals, in accordance with the plans, the specifications and at the directions of the facility operator(s) in consultation with the Resident Engineer. The unit price shall also include all costs associated with any and all modifications of the maintenance of pedestrian and vehicular traffic, and traffic plates, and openings and closings of plates, and cones, barrels, arrow-boards, etc. and installing, shifting, moving and relocating cones, barrels, arrow-boards, etc. as may be required in order to facilitate this item. The unit price shall further include the cost of maintaining, protecting, and accommodating the integrity of utility facilities during the performance of roadway reconstruction within the areas designated on the plans or as encountered and directed by the facility operator(s) in consultation with the Resident Engineer, and the incremental additional work and effort made necessary to furnish and place an acceptable fill material, as may be required, install and remove temporary restoration material and install the new pavement (base concrete or other pavement as applicable) under other contract items. Any and all alternate methods of construction operation changes, which may include changes in equipment and sequencing and the use of hand held tools, proposed by the Contractor and approved by the facility operator in consultation with the Resident Engineer are included in the price bid for this item.

Payment for all work herein specified shall be made on a one-time basis only; no payment for work herein specified shall be made for the same area more than one time. No payments will be made under this item if the Contractor excavates beyond the limits specified in the contract and enters the 12-inch zone of protection, unless directed by the facility operator(s) in consultation with the Resident Engineer. In addition, work under this item shall be paid in combination with other City, utility or facility accommodation items under other contract bid items.

F. References

1. Special Care Excavation Plan

JB 710 - REMOVAL OF ABANDONED UTILITY STEEL/CAST IRON/PLASTIC PIPES

A. Description

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required for the removal and disposal of abandoned steel and cast iron/plastic pipelines of various diameter sizes, and their appurtenances for non-cost sharing utility facilities. The item specified under this section shall not be measured for payment in conjunction with any other types of JB items. All work shall be performed in accordance with the contract plans, the specifications, and at the directions of the facility operator in consultation with the Resident Engineer.

B. Materials

All materials, including but not limited to clean backfill, shall be supplied by the Contractor and comply with the filling and backfilling requirements of Section 4.11 of the Bureau of Highway Standard Specifications.

C. Method of Construction

The Contractor shall excavate all materials of whatever nature encountered to remove abandoned pipe. Where necessary around and under other City and privately owned facilities, the Contractor shall be required to excavate by hand, using hand-held power tools. Removal of abandoned pipe shall be done by normal excavation equipment. Steel pipe shall be cut with torch or saw at intervals convenient for its removal. Prior to cutting any pipe whose end is not open and visible, the Facility Operator shall test and certify in a timely manner that the abandoned pipeline is free of combustible gas and/or live cable prior to removal. The Contractor shall notify facility operator through its authorized representative 48 hours in advance of work in areas where pipelines have been abandoned, as identified by the authorized facility operator representative. The Contractor shall then seal open end of pipe remaining in the excavation with concrete or caps (caps to be provided by the facility operator), where directed by the facility operator in consultation with the Resident Engineer, and backfill the area with clean fill.

D. Method of Measurement

Removal of Abandoned Utility Steel/Cast Iron/Plastic Pipes shall be measured for payment per linear foot (LF) of pipe removed, measured in place along its axis between the inner faces of the pipe. Each pipe size classification will be paid for separately. The size classifications are defined as follows:

1. JB 710.1 Up to and including 12" diameter pipes.
2. JB 710.2 Over 12" and up to and including 20" diameter pipes.
3. JB 710.3 Over 20" diameter pipes.

E. Price to Cover

The unit prices bid per linear foot for Removal of Abandoned Utility Steel/Cast Iron/Plastic Pipes shall cover the cost of all labor, equipment, insurance and incidentals required for the removal and disposal of abandoned steel and cast iron pipelines of various diameter sizes, and their appurtenances for non cost sharing utility facilities in accordance with the plans, specifications, and the directions of the facility operator. Payment shall include but not be limited to the cost of excavation by hand around and other City and facility operator owned properties and, where necessary, support and protection of such properties, the breaking, cutting, and/or burning of abandoned pipes and their disposal from the site, sealing open ends remaining in the excavation with concrete or caps (caps top to be provided by the facility operator), and backfilling of the area with clean backfill where the pipeline has been removed.

F. References

Section 4.11 Bureau of Highway Standards Specifications

JB 711 - USE SHEETING LINE AS FORM

A. Description

Under this item, the Contractor shall provide all labor, equipment, materials, insurance and incidentals necessary to utilize/modify the trench sheeting as formwork for one side of the proposed sewer cradle as directed by the Resident Engineer in consultation with the Facility Operator. The required side is defined in the Contract Drawings. All work shall be in accordance with this specification and all applicable NYC-DDC specifications, including Section 4.05.4 (C) of the Standard Sewer Specifications.

B. Materials

The sheeting, within the limits of the cradle, shall be covered with a material selected by the Contractor that will allow the removal of the sheeting and as directed by the Resident Engineer in consultation with the Facility Operator.

Materials shall conform to the applicable NYC-DDC design specifications for sheeting and formwork.

Submittals & Approvals - The Contractor shall submit a NYS Licensed Professional Engineer (P.E.) approved sheeting plan and calculations that comply with D.D.C. design specifications for sheeting systems and include this requirement. Submittals for approval shall be made to the Resident Engineer in consultation with the facility operator.

C. Methods of Construction

Where any existing utilities or facilities are indicated on the plans or in NYS Industrial Code Rule 753 mark-outs adjacent to the proposed work, trenches shall be excavated as per the requirements of NYS Industrial Code Rule 753 to determine the limits of the existing facilities. This excavation and any excavation to remove any material, which stops the driving of sheeting, are included in this Item. Sheeting shall only be driven when the limit of adjacent utilities or facilities is known. It shall be the Contractor's responsibility to install sheeting in conformance with City, State and Federal Safety Codes.

Sheeting placed under this item shall be tight and continuous. Skeleton sheeting will not be permitted.

Where applicable, the excavation method and sheeting type and method of placement, shall take into account the removal or maintenance of the existing sewer, if required by NYC-DDC.

The formwork shall be lined in such a manner to prevent the infiltration of soil and water and to allow the removal of the sheeting upon hardening of the concrete.

During sheeting removal, place and tamp clean sand into the void created by the removal of the formwork.

The Contractor shall take all necessary precautions to prevent the undermining of adjacent utilities and facilities.

D. Method of Measurement

The quantity to be paid for under this item will be the number of linear feet (LF) of trench where the modified sheeting system is installed.

E. Price to Cover

The unit price bid per linear foot of trench where modified sheeting is installed shall include the cost of all labor, equipment, materials, insurance and incidentals necessary to modify/install and remove the sheeting as form work. Work under this item shall also include any additional costs associated with the modification of any maintenance of traffic and furnishing, placing and tamping sand backfill over and above that paid under NYC-DDC Item(s). Payments to support and protect private utility facilities will be paid under the applicable JB Item. The price to locate all private utilities that are parallel or encroaching the proposed trench shall be paid under the applicable JB Test Pit Item.

F. References

1. NYS Industrial Code Rule 753

JB 781 - REMOVABLE CURB SIDEWALK PANEL FOR ACCESS TO UTILITY STRUCTURE OPENINGS

A. Description

This section describes the work required for construction of removable curb sidewalk panels for access to utility structure openings in accordance with the plans, the specifications, and at the direction of the facility operator in consultation with the Resident Engineer.

The work shall consist of unloading, handling, storing, and installing curb panels (panels to be supplied by facility operator) over the existing structures to provide a continuation of the adjacent curbs over the structures and permit the removal of the curb piece for access to the structure covers. The work also includes the concrete foundation under the panel frame and all excavation required for the above operations.

B. Materials

Concrete shall be Class B-32, Type IIA; cement - Type II, Portland; sand - Type IA; and coarse aggregate - Type I, Grade B, or Type 2, Size No. 57. An approved air-entraining agent shall be added at the same time concrete ingredients are mixed with water.

All other materials shall conform to the requirements of the Consolidated Edison Company Drawing No. EO-13147-B, Rev. 10 "Removable Curb Sidewalk Panel for Access to Manhole Openings".

C. Method of Construction

Excavation shall comply with the requirements of Section 6.02 of the Standard Highway Specifications. All excess material resulting from excavation shall be removed from the site immediately.

All concrete work shall comply with the requirements of Section 4.06 of the Standard Highway Specifications.

The Contractor shall comply with Sections 2 and 3 of the General Provisions except that the contractor shall notify the facility operator's representative on the site at least two (2) weeks in advance as to when he requires delivery of the panels.

The installation of each panel must conform to actual field measurements and to the requirements of the Consolidated Edison Company Drawing No. EO-13147-B, Rev. 10 "Removable Curb Sidewalk Panel for Access to Manhole Openings."

D. Method of Measurement

The quantity to be measured for payment shall be the number of each (EA) Removable Curb Sidewalk Panel, actually incorporated into the work, complete.

E. Price to Cover

The unit price bid per each of the Removable Curb Sidewalk Panel shall cover the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required and completing the work including excavation; excess removal; concrete work; grouting; unloading, handling, storing, and installing of curb panels to be furnished by the facility operator; field measurements; field painting; curbing; and all necessary incidental work, in accordance with the plans, the specifications and the directions of the Engineer and facility operator's representative.

F. References

1. Con Ed Drawing EO-13147-B Rev. 10
2. Section 6.02 Standard Highway Specifications
3. Section 4.06 Standard Highway Specifications

JB 800 - MODIFICATION OF TROLLEY STRUCTURE REMOVAL WHEN CROSSING UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all incremental labor, equipment, insurance and incidentals required to maintain and protect and accommodate the integrity of utility facilities that include but are not limited to:

1. Conduits;
2. Conductors;
3. Concrete encased Conduit banks;
4. Steel Pipes; Steam Facilities;
5. Oil-o-static Facilities; and
6. Non-cost Sharing Gas Facilities;

of various sizes and configurations crossing trolley structures at various angles located within a zone of protection, as indicated on Sketch JB 800A, during the removal of trolley structures (including but not limited to rails, timber ties, yokes, trolley conduits, main conduit, rail, trolley vaults and yoke foundations) and subsequent backfilling operations. Utility facilities that run parallel to trolley structures are not included within this item and will be paid for under the appropriate JB item. The work shall be performed in accordance with the contract plans, the specifications, and as encountered during construction and directed by the facility operator in consultation with the Resident Engineer.

B. Materials – N/A

C. Method of Construction

The Contractor shall maintain, protect, and accommodate the integrity of all utility facilities of various sizes and configurations crossing trolley structures within a zone of protection as indicated in Sketch JB 800A, during removal of trolley structures and subsequent backfilling and compaction operations under other contract item(s). The facility operator shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the utility and ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently, and at the sole discretion of the facility operator to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with hand held power tools to remove existing trolley structure within the zone of protection whose limit shall be defined as a perimeter located 36 inches from the outside face of each utility crossing.

D. Method of Measurement

The quantity to be measured for payment shall be the number of linear feet of modified trolley structure removal within the zone of protection as indicated on Sketch JB 800A, measured along the centerline of trench. The zone of protection shall be defined, for the purpose of this agreement, as the boundary/area designated on the plans or a boundary/area 3 feet to either side of each of the designated facilities, based upon available records and/or information obtained from prior or new test pits, or any combination thereof. Where overlapping of the zones occurs due to multiple

facilities, the boundary/area shall be modified to one zone measured from the outside limits. The contract item specified under this section shall not be measured for payment in conjunction with other types of utility items. Modifications to work methods required in areas between zones of protection for multiple utility facilities shall not be measured for payment and are included in the price bid for this item.

E. Price to Cover

The unit price bid per linear foot shall include the incremental cost for all labor, equipment, and incidentals required to maintain and protect and accommodate the integrity of utility facilities during the removal of trolley structures (including rails, timber ties, yokes, trolley conduits, main conduit, rail and yoke foundations), and backfilling and compacting within a zoned area designated for protection of utilities by the facility operator in consultation with the Resident Engineer.

F. Reference

Sketch JB 800A

JB 801 - MODIFICATION OF TROLLEY STRUCTURE REMOVAL PARALLEL TO UTILITY FACILITIES

A. Description

Under this section, the Contractor shall provide all incremental labor, equipment, insurance and incidentals required to maintain, protect, support and accommodate the integrity of utility facilities that include but are not limited to:

1. Conduits;
2. Conductors;
3. Concrete encased Conduit banks;
4. Steel Pipes; Steam Facilities;
5. Oil-o-static Facilities; and
6. Non-cost Sharing Gas Facilities;
7. Steam Facilities;

of various sizes and configurations paralleling or encroaching trolley structures (including but not limited to rails, timber ties, yokes, trolley conduits, main conduit, rail, trolley vaults and yoke foundations)located within a zone of protection, as indicated on the Plans, during all trolley structure removal operations and subsequent backfilling operations. Utility facilities that cross over, under and between the trolley structures are not included within this item and will be paid for under the appropriate JB item. The work shall be performed in accordance with the contract plans, the specifications, and as encountered during construction and directed by the facility operator(s) in consultation with the Resident Engineer.

B. Materials – N/A

C. Method of Construction

The Contractor shall maintain, protect, support and accommodate the integrity of all utility facilities of various sizes and configurations paralleling or encroaching trolley structures within a zone of protection as indicated on the Plans and as directed by the facility operator(s) in consultation with the Resident Engineer, during removal of trolley structures and subsequent backfilling and compaction operations paid for under other contract item(s). The facility operator(s) shall identify the locations of all utilities within the contract area as required by New York State Industrial Code Rule 753. As provided by the Rule, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the utility and ascertain the numerical relationships and/or dimensions of these utilities with respect to the proposed excavation. Upon exposing the affected utilities sufficiently, and at the sole discretion of the facility operator(s) in consultation with the Resident Engineer to determine relationships and/or dimensions, the Contractor shall be permitted to proceed with hand held power tools to remove existing trolley structure within the zone of protection whose limit shall be defined as a perimeter located 36 inches from the outside face of each utility.

D. Method of Measurement

The quantity to be measured for payment shall be the number of linear feet of modified trolley structure removal within the zone of protection as indicated on the plans, measured along the centerline of trench. The contract item specified under this section shall not be measured for payment in conjunction with other types of utility items. Modifications to work methods required in areas between zones of protection for multiple utilities or JB facilities shall not be measured for payment and are included in the price bid for this item.

E. Price to Cover

The unit price bid per linear foot shall include the incremental cost for all labor, equipment, and incidentals required to maintain, protect, support and accommodate the integrity of utility facilities paralleling or encroaching trolley structures during the removal of trolley structures (including rails, timber ties, yokes, trolley conduits, main conduit, rail and yoke foundations), and backfilling and compacting within a zoned area designated for protection of utilities by the facility operator(s) in consultation with the Resident Engineer.

The price shall include any additional cutting, removing and disposing of roadway materials; hand or machine excavation; trucking and disposing of excavated materials, installation and removal of sheeting; and furnishing, installing and compacting backfill that may be required to support, protect, maintain and accommodate the integrity of utility facilities. The price shall also include the incremental cost for providing all vehicular and pedestrian traffic maintenance necessary to perform the work.

The Contractor shall be responsible for any and all damages resulting from and/or due to trolley demolition operations that are not performed in accordance with the specifications.

F. References

1. NYS Industrial Code Rule 753

JB 900 – EXTRA UTILITY WORK COSTS ALLOWANCE

A. Description - Use of contract Item JB-900 "Extra Utility Work Costs Allowance" - Fixed Sum

This item is applicable only for extra Utility Work. If it is determined that there is extra Utility Work for which there are no items in the Unit Price Book, then the Utility and City Contractor shall negotiate the cost of supporting and protecting, and/or alleviating the impact on the Public Work caused by the extra Utility Work with each other with the understanding that the performance of Public Work shall continue during all negotiations and discussions.

(a) If the parties reach an agreement on cost for the extra Utility Work when there are no bid items available in the Unit Price Book, then the City Contractor and the Utility shall jointly submit a copy to the City's RE the agreed upon price along with all supporting documentation. The City Contractor shall be paid by requisitions submitted in accordance with the agreed upon price. All such extra utility work shall be totaled and the total shall be paid under Item JB 900.

(b) If the parties do not reach an agreement on the extra Utility Work within seven (7) Business Days from the start of negotiations, then parties will resolve the dispute through the dispute resolution process, as set forth in Appendix "C". During the arbitration process, the extra Utility Work will be performed and paid for on a time and material basis or an alternate method of payment, as set forth in the City's standard construction contract.

(c) When time and material is used during arbitration or if the Utility and the City Contractor can agree on an alternative method for payment for the Utility Work, then that method may be applied by the Utility, with notice to the City. The total value of such Time and Material or alternative method of payment shall be paid under Item JB 900.

B. Materials

All materials shall be supplied by the Contractor and approved by the facility operator in consultation with the Resident Engineer.

C. Method of Construction

As required.

D. Method of Measurement

No guarantee is given that this allowance item will in fact be required in this contract. The estimated "fixed sum" amount in the Bid Schedule is included in the total bid solely to insure funding availability.

The quantity to be measured for payment shall be each lump sum (LS) amount of the extra utility work, or Time and Material amounts. Payments for extra Utility Work or Time and Material shall be made under JB-900 allowance item and shall be documented with a proper Change Order Request, provided that sufficient funding of JB-900 for each affected utility(ies) is available. Change Order Requests and Overrun Change Order Requests for Utility Work shall be submitted separately from Public Work Change Order Requests and Overrun Change Order Requests. The costs breakdown by items for each participating Utility shall be clearly tabulated and sub-totaled. Public Work costs shall not be combined with Utility Work Costs on Change Order Requests of any type.

E. Price to Cover

Payment made under each lump sum (LS) amount, shall cover the cost of all labor, materials, equipment, supervision, insurance and incidentals necessary to complete the extra utility work. The price includes the modification of any methods of construction and operation and associated changes in sequencing of the City contract work as required, in order to perform the extra utility work and/or the City contract work. Each lump sum (LS) amount includes all special considerations due to all site conditions, loss of productivity and efficiency, idle time, demobilization and remobilization, site maintenance, maintenance of traffic and protection, extended performance, extended overhead costs, extended engineering and extended home office costs in connection with the extra utility work. In consideration of each lump sum (LS) amount, the contractor waives all claims for impacts arising from the extra utility work, which shall be deemed included in each lump sum amount paid.

The total estimated cost of this item is the "fixed sum" amount shown for this item in the Bid Schedule. No guarantee is given that the actual lump sum cost for this item will in fact be the "fixed sum" amount. The "fixed sum" amount is included in the total bid solely to insure that sufficient monies will be available to pay the Contractor under this item.

F. References

None

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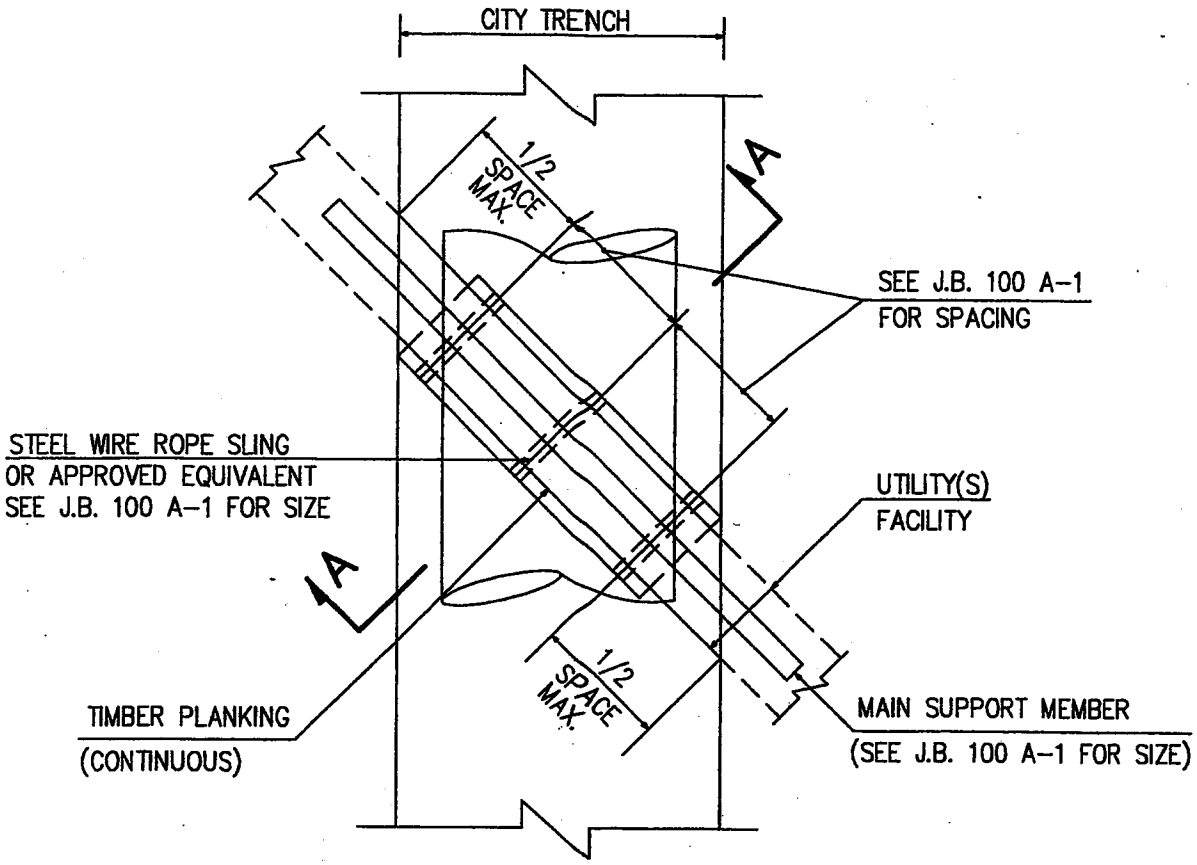
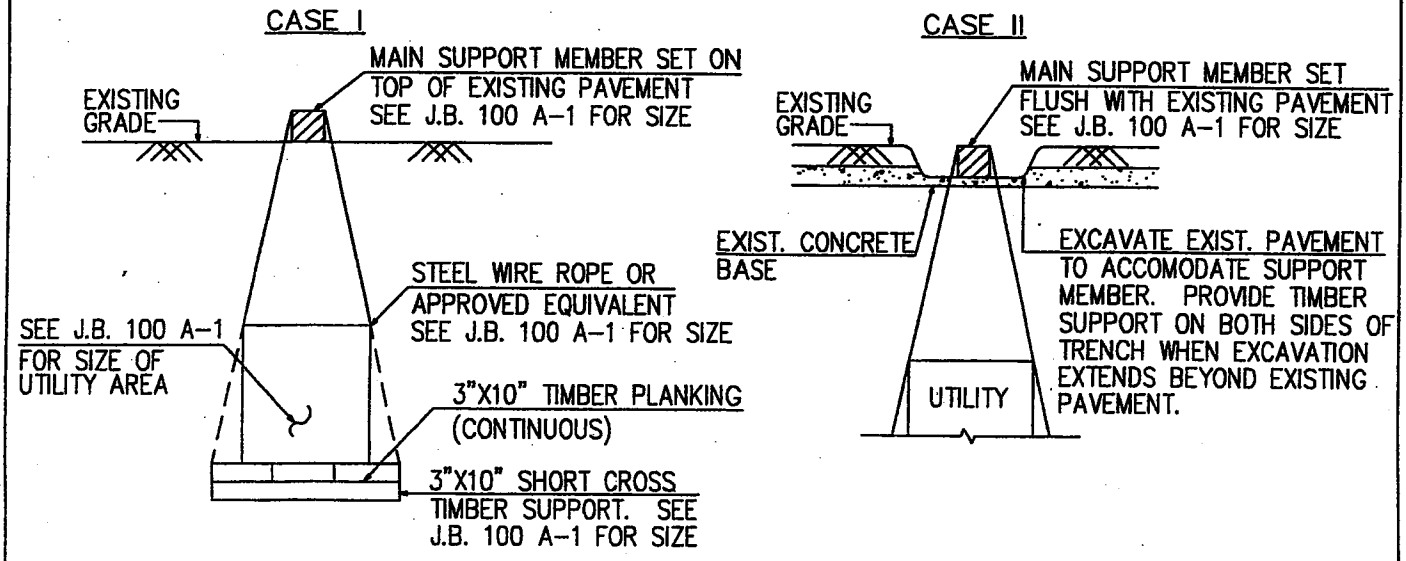


PLAN

N.T.S.



SECTION A-A

N.T.S.

NOTE:
VARIOUS ANGLES AND DEPTH
ARE AS DEFINED IN
ITEM J.B. 100-116.

REVISIONS

J.B. SKETCH	
TEMPORARY SUPPORT OF UTILITY(S) CROSSING CITY TRENCH	
CONTRACT NO.	SKETCH NO. J.B. 100 A

WATER/ SEWER DIAM.	CROSS SECTION AREA OF PRIVATE UTILITIES	INTERMEDIATE SUPPORT SLING *		NUMBER OF MAIN TIMBER SUPPORT MEMBERS				MAIN STEEL SUPPORT MEMBERS	TIMBER SHORT SIZE SEE NOTE 1
		NUMBER REQUIRED	UTILITY SUPPORT LENGTH	4" X 4"	4" X 8"	3" X 10"	4" X 12"	1 REQUIRED	1 PER SLING
D<12"	A<0.75 S.F.	1	7.1 FT	1	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	2	7.1 FT	–	1	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	3	7.1 FT	–	–	2	–	W 6 X 15	4" X 4"
	6.00<A<10.0 S.F.	4	7.1 FT	–	–	3	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	4	7.1 FT	–	–	–	2	W 6 X 25	3" X 10"
	15.0<A<20.0 S.F.	4	7.1 FT	–	–	–	3	W 6 X 25	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
12"<D<24"	<0.75 S.F.	1	8.5 FT	2	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	2	8.5 FT	–	1	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	4	8.5 FT	–	–	3	–	W 6 X 15	4" X 4"
	6.00<A<10.0 S.F.	5	8.5 FT	–	–	4	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	5	8.5 FT	–	–	–	3	W 6 X 25	3" X 10"
	15.0<A<20.0 S.F.	5	8.5 FT	–	–	–	4	W 6 X 25	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
24"<D<36"	A<0.75 S.F.	1	9.9 FT	2	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	3	9.9 FT	–	1	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	4	9.9 FT	–	–	3	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	6	9.9 FT	–	–	5	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	6	9.9 FT	–	–	–	4	W 6 X 25	3" X 10"
	15.0<A<20.0 S.F.	6	9.9 FT	–	–	–	5	W 8 X 31	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
36"<D<48"	A<0.75 S.F.	2	11.3 FT	3	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	3	11.3 FT	–	2	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	5	11.3 FT	–	–	4	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	7	11.3 FT	–	–	7	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	7	11.3 FT	–	–	–	5	W 8 X 31	3" X 10"
	15.0<A<20.0 S.F.	7	11.3 FT	–	–	–	7	W 8 X 31	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
48"<D<54"	A<0.75 S.F.	2	12.0 FT	3	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	3	12.0 FT	–	2	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	5	12.0 FT	–	–	5	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	7	12.0 FT	–	–	8	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	7	12.0 FT	–	–	–	6	W 8 X 31	3" X 10"
	15.0<A<20.0 S.F.	7	12.0 FT	–	–	–	7	W 10 X 33	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
** 54"<D<60"	A<0.75 S.F.	2	12.7 FT	3	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	4	12.7 FT	–	2	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	6	12.7 FT	–	–	5	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	8	12.7 FT	–	–	9	–	W 8 X 18	3" X 10"
	10.0<A<15.0 S.F.	8	12.7 FT	–	–	–	6	W 8 X 31	3" X 10"
	15.0<A<20.0 S.F.	8	12.7 FT	–	–	–	8	W 10 X 33	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
60"<D<72"	A<0.75 S.F.	2	14.1 FT	4	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	4	14.1 FT	–	2	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	7	14.1 FT	–	–	6	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	9	14.1 FT	–	–	10	–	W 8 X 31	3" X 10"
	10.0<A<15.0 S.F.	9	14.1 FT	–	–	–	8	W 10 X 45	3" X 10"
	**15.0<A<20.0 S.F.	9	14.1 FT	–	–	–	10	W 10 X 45	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
72"<D<84"	A<0.75 S.F.	2	15.5 FT	5	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	5	15.5 FT	–	3	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	7	15.5 FT	–	–	8	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	10	15.5 FT	–	–	12	–	W 8 X 31	3" X 10"
	10.0<A<15.0 S.F.	10	15.5 FT	–	–	–	9	W 10 X 45	3" X 10"
	15.0<A<20.0 S.F.	10	15.5 FT	–	–	–	12	W 10 X 45	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							
> 84"	A<0.75 S.F.	2	15.5 FT	5	–	–	–	W 4 X 13	2" X 4"
	0.75<A<2.00 S.F.	5	15.5 FT	–	3	–	–	W 6 X 15	3" X 4"
	2.00<A<6.00 S.F.	7	15.5 FT	–	–	8	–	W 8 X 18	4" X 4"
	6.00<A<10.0 S.F.	10	15.5 FT	–	–	12	–	W 8 X 31	3" X 10"
	10.0<A<15.0 S.F.	10	15.5 FT	–	–	–	9	W 10 X 45	3" X 10"
	15.0<A<20.0 S.F.	10	15.5 FT	–	–	–	12	W 10 X 45	4" X 10"
	>20.0 S.F.	(METHOD OF SUPPORT TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY FACILITY OPERATOR)							

NOTES

1. TIMBER SHORT CROSS SIZE SUPPORTING 3"x10" CONTINUOUS TIMBER PLANKS
2. THIS SKETCH SHALL NOT BE USED FOR COMPUTATION OF PAYMENT LINES. FOR PAYMENT SEE J.B. SKETCH 100E.

* SLING SHALL BE 2" WIDE NYLON STRAP OR EQUIVALENT (SLING CAPACITY SHALL BE 6,000 LBS.) ONE (1) TIMBER SHORT CROSS REQUIRED AT EACH SLING SUPPORTING 3"x10" CONTINUOUS TIMBER PLANKS.

ASSUMPTIONS

1. ASSUME CROSS SECTION AREAS ARE SOLID CONCRETE AT 150lb./C.F.
2. ASSUME ALLOWABLE BENDING STRESS FOR TIMBER MEMBERS IS 1200 PSI.
3. ASSUME ALLOWABLE TIMBER SHEER STRESS IS 90 PSI.
4. ASSUME ALLOWABLE SHEAR STRESS FOR STEEL MEMBERS IS 1000 PSI.

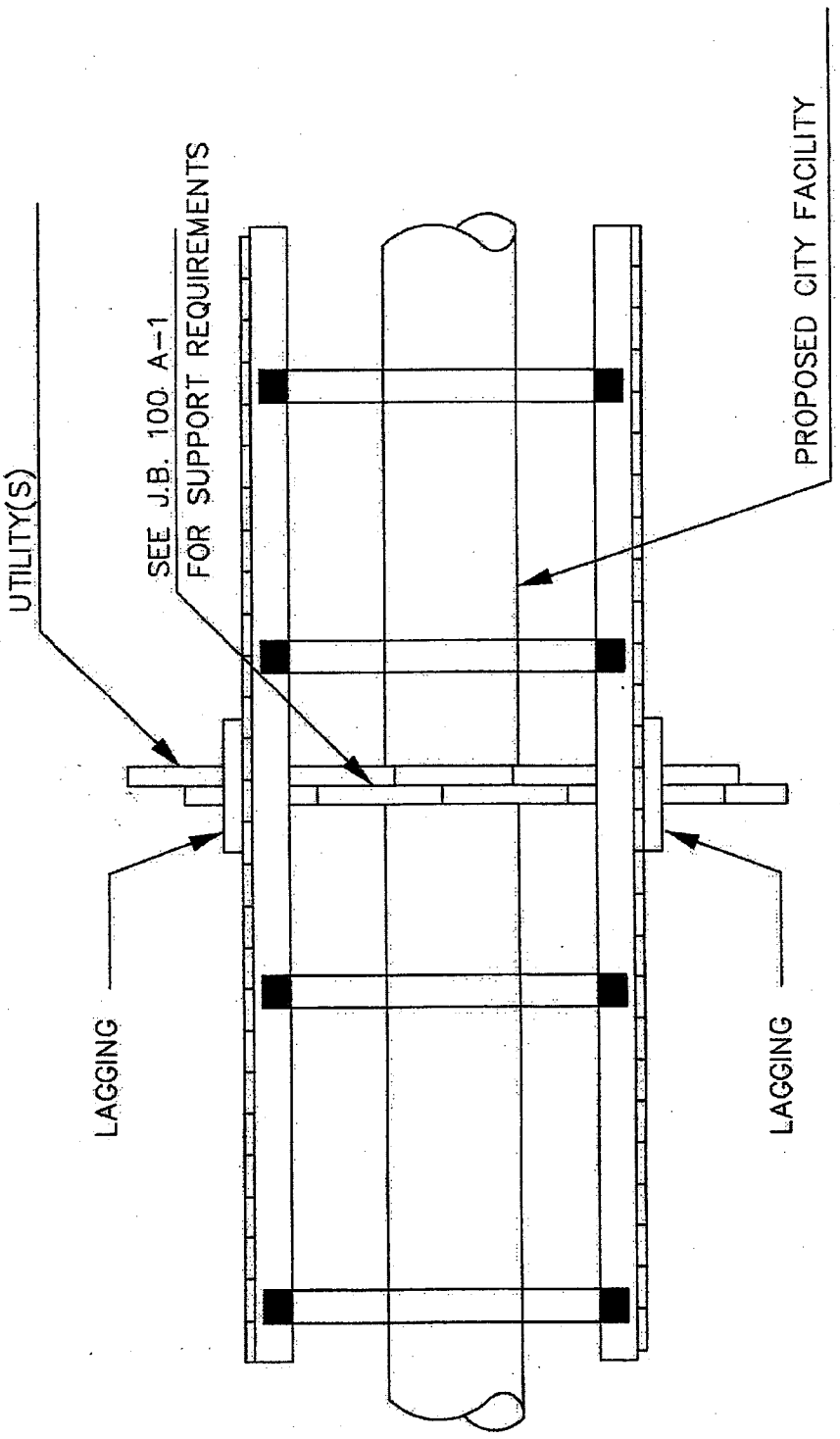
** ALSO APPLIES FOR 9'x9' EXCAVATIONS FOR CATCHBASINS UNDER ITEM J.B. 225

REVISIONS

J.B. SKETCH

SUPPORT REQUIREMENTS FOR PRIVATE UTILITY CROSSING ITEMS (PLAN & SECTION A–A SKETCH NO. 100 A)

CONTRACT NO.	SKETCH NO. J.B. 100 A–1

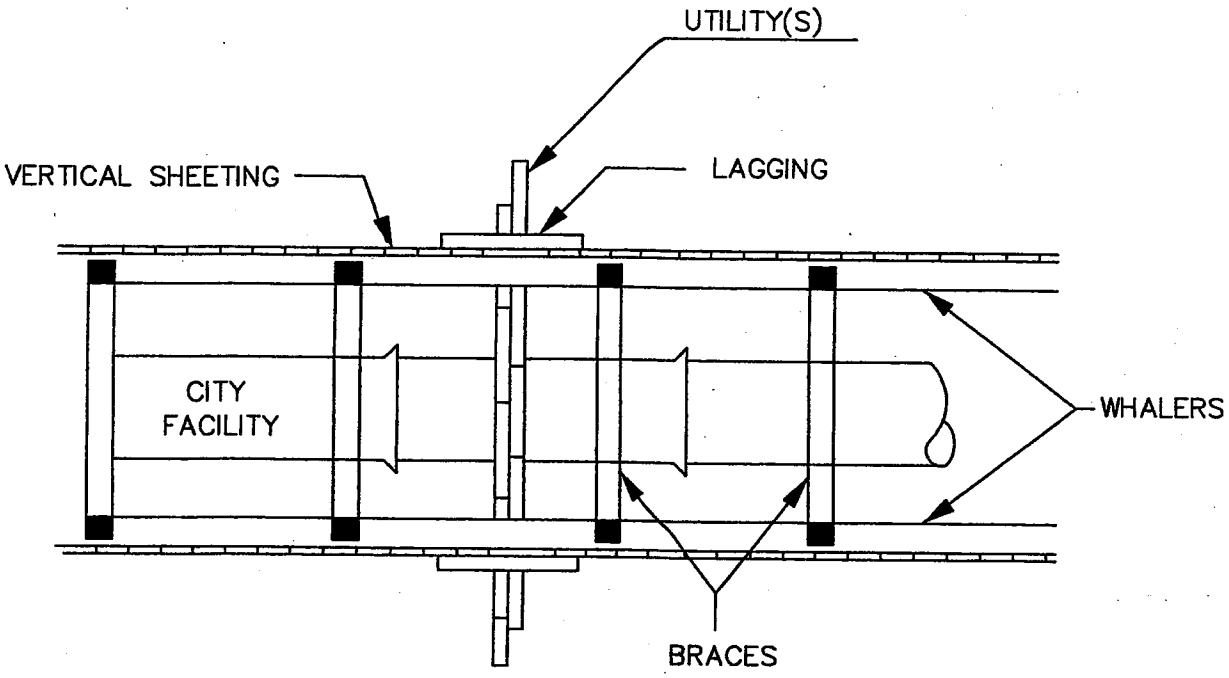


PLAN VIEW

N.T.S.

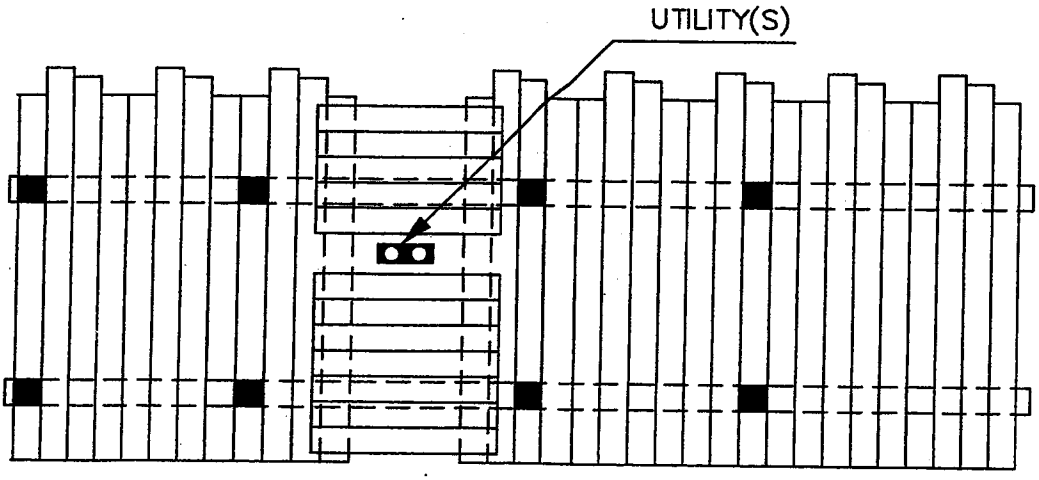
J.B. SKETCH	
TYPICAL SUPPORT MAINTENANCE AND PROTECTION OF J.B. FACILITIES	
CONTRACT NO.	SKETCH NO. J.B. 100 B

REVISIONS



PLAN VIEW

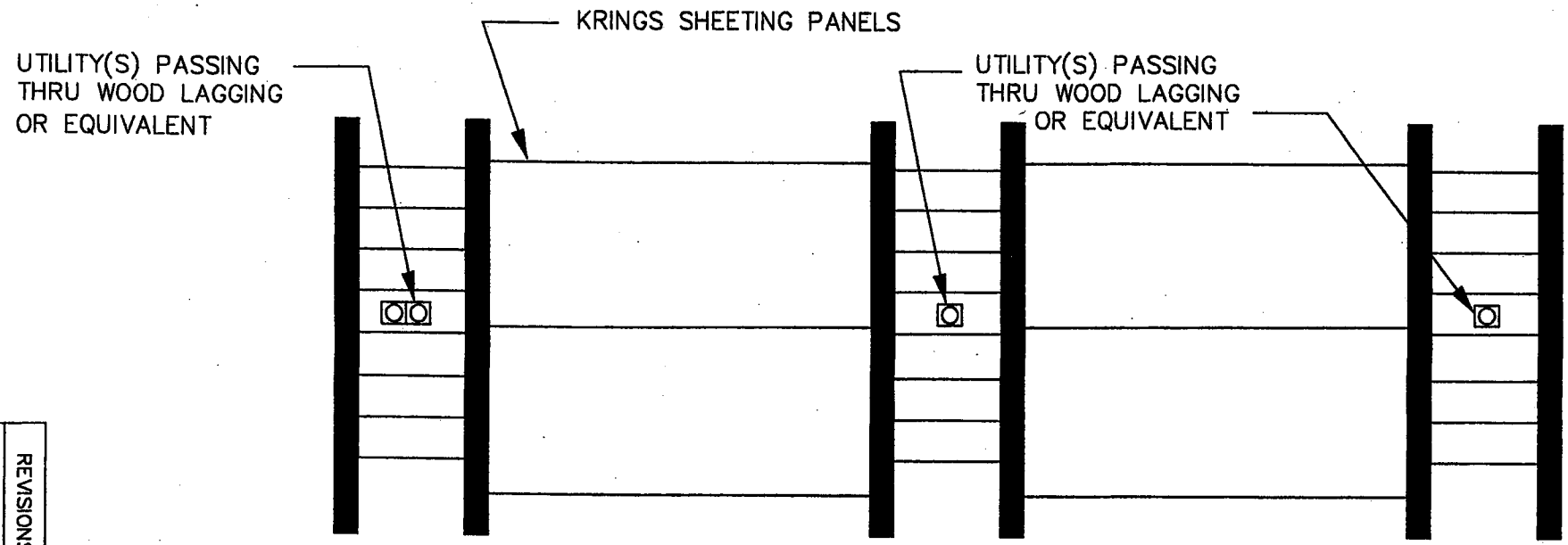
N.T.S.



PROFILE VIEW

N.T.S.

	J.B. SKETCH
	LAGGING
REVISIONS	
	CONTRACT NO. / SKETCH NO. J.B. 100 C



PROFILE VIEW

N.T.S.

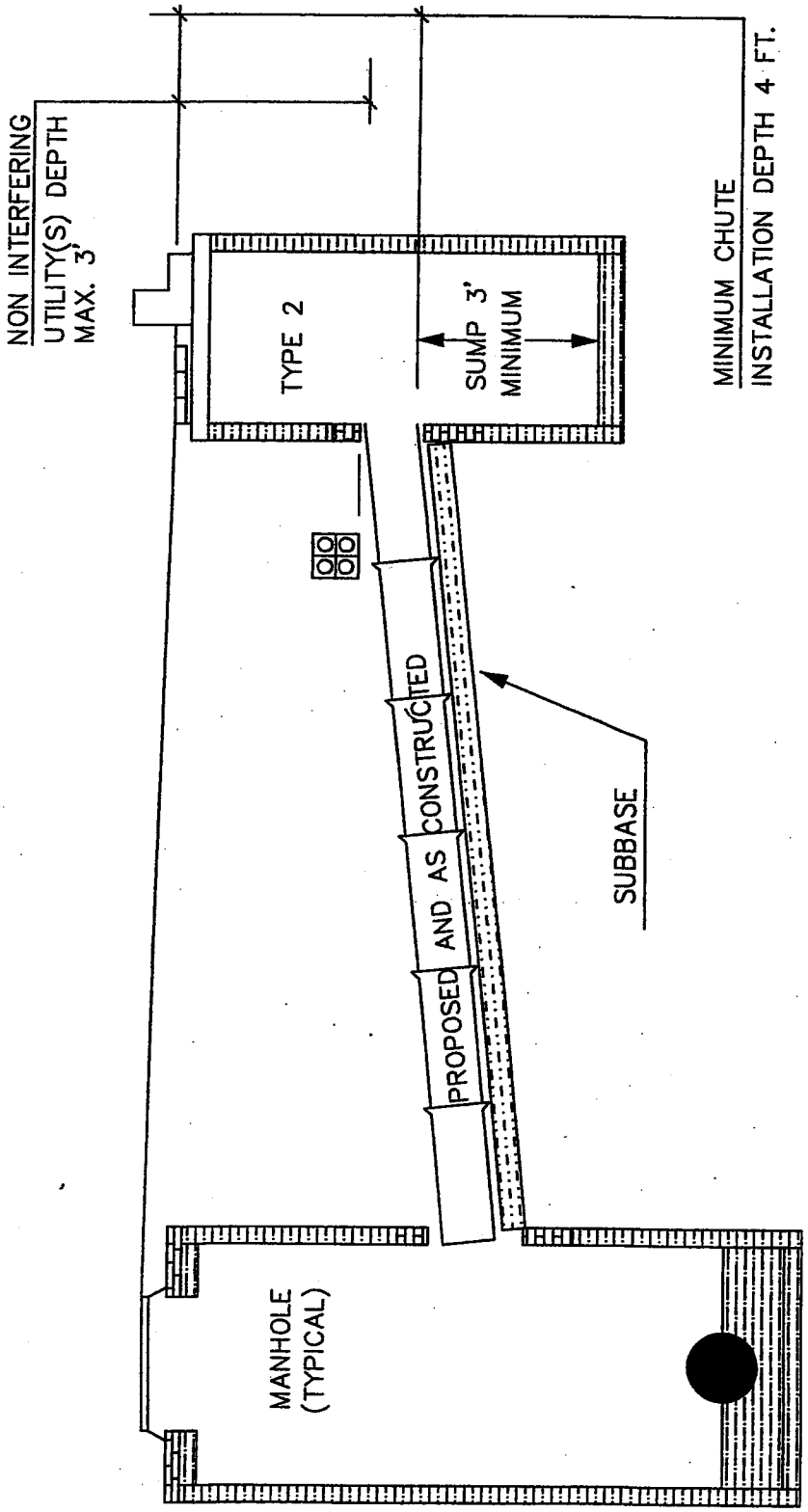
REVISIONS

J.B. SKETCH

PROFILE VIEW OF KRINGS SHEETING

CONTRACT NO.

SKETCH NO.
J.B. 100 C-1

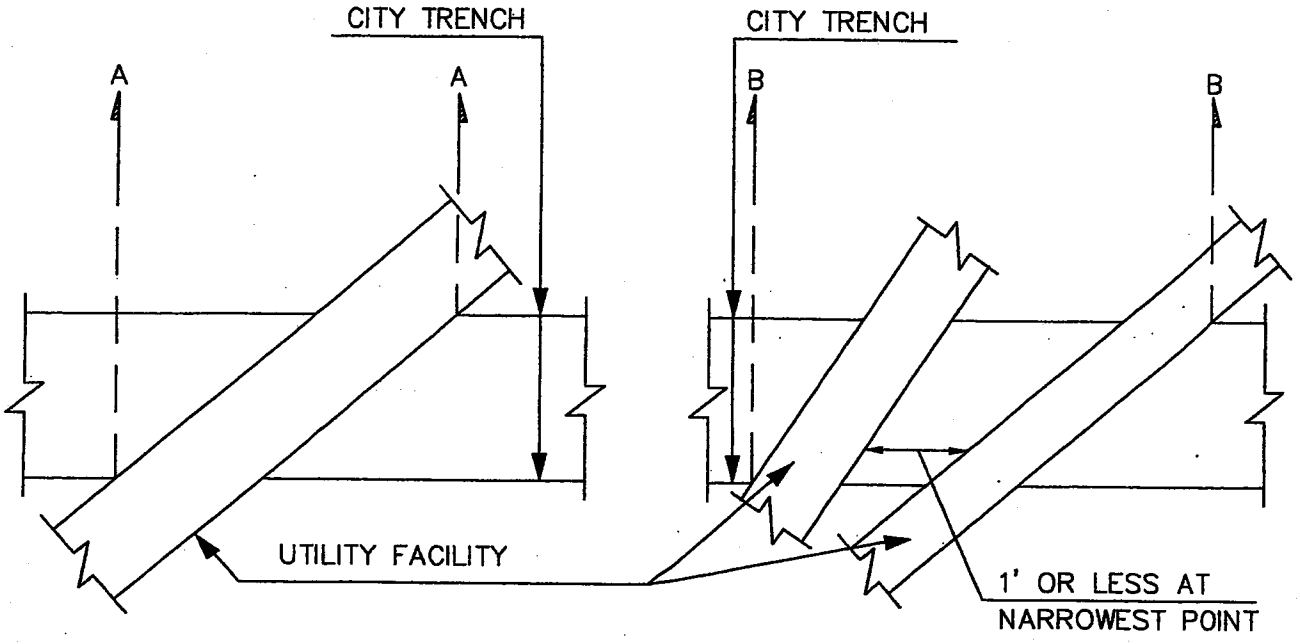


PROFILE

N.T.S.

J.B. SKETCH	
UTILITY CROSSING DURING CATCH BASIN CHUTE CONNECTION PIPE INSTALLATION	
CONTRACT NO.	SKETCH NO. J.B. 100 D

REVISIONS

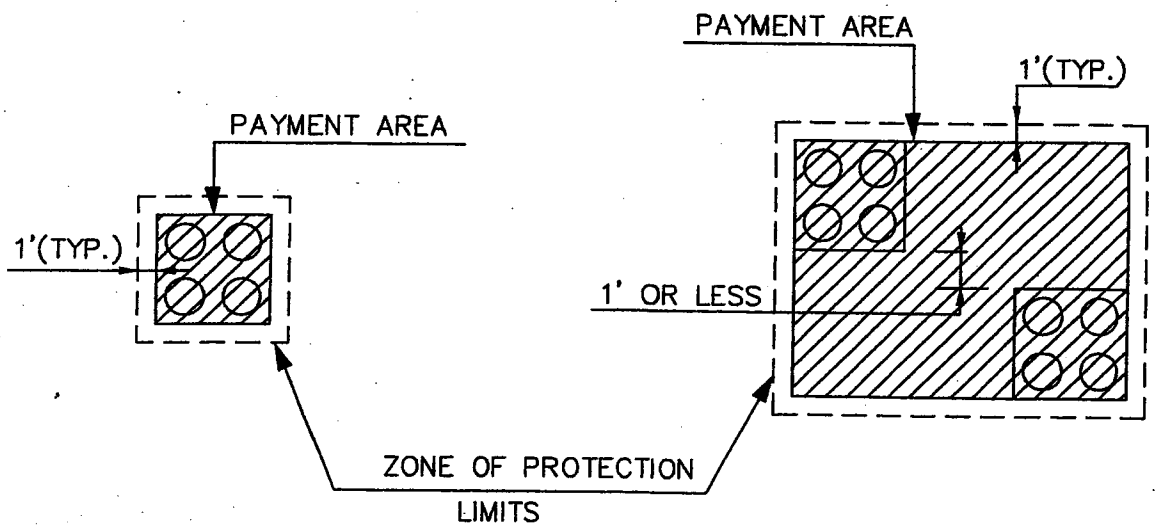


SINGLE UTILITY CROSSING

NOT TO SCALE

MULTIPLE UTILITY CROSSING

NOT TO SCALE



SECTION A–A

NOT TO SCALE

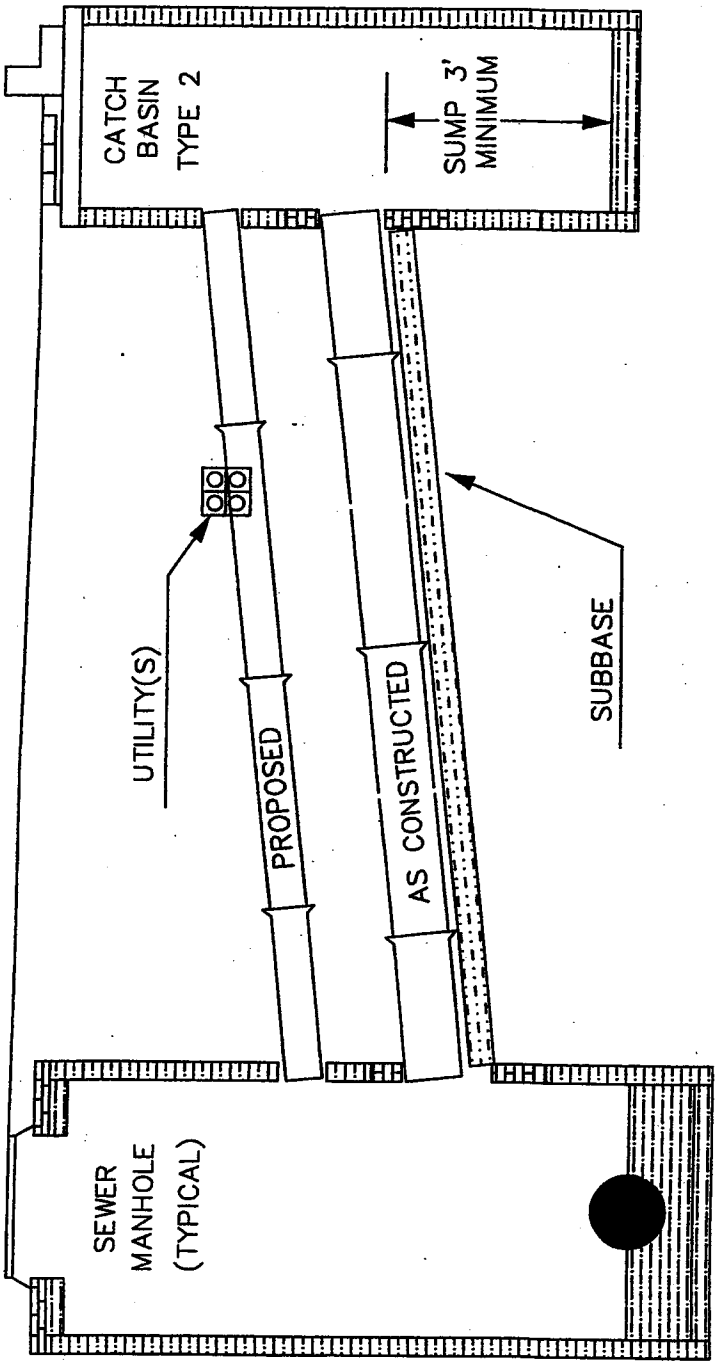
SECTION B–B

(AT WIDEST POINT)
NOT TO SCALE

NOTE:
VARIOUS ANGLES AND DEPTH ARE AS DEFINED IN ITEM J.B. 100–116.

REVISIONS

J.B. SKETCH	
TYPICAL METHOD OF MEASUREMENT FOR UTILITY(S) CROSSING	
CONTRACT NO.	SKETCH NO. J.B. 100 E

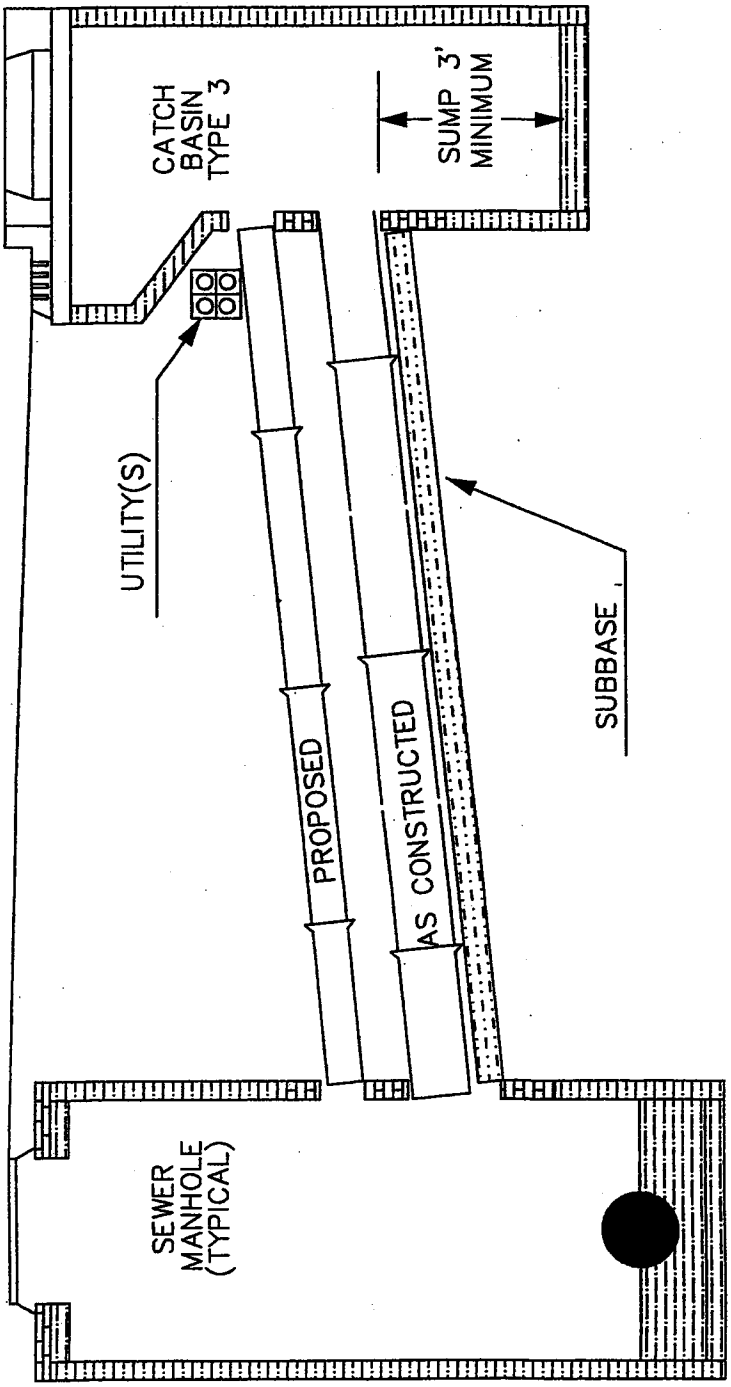


PROFILE

N.T.S.

NOTE:
VARIOUS ANGLES ARE AS DEFINED IN J.B. 200.

REVISIONS	J.B. SKETCH
	ACCOMODATIONS OF UTILITIES DURING CATCH BASIN CHUTE CONNECTION PIPE INSTALLATION
	CONTRACT NO. / SKETCH NO. J.B. 200 A

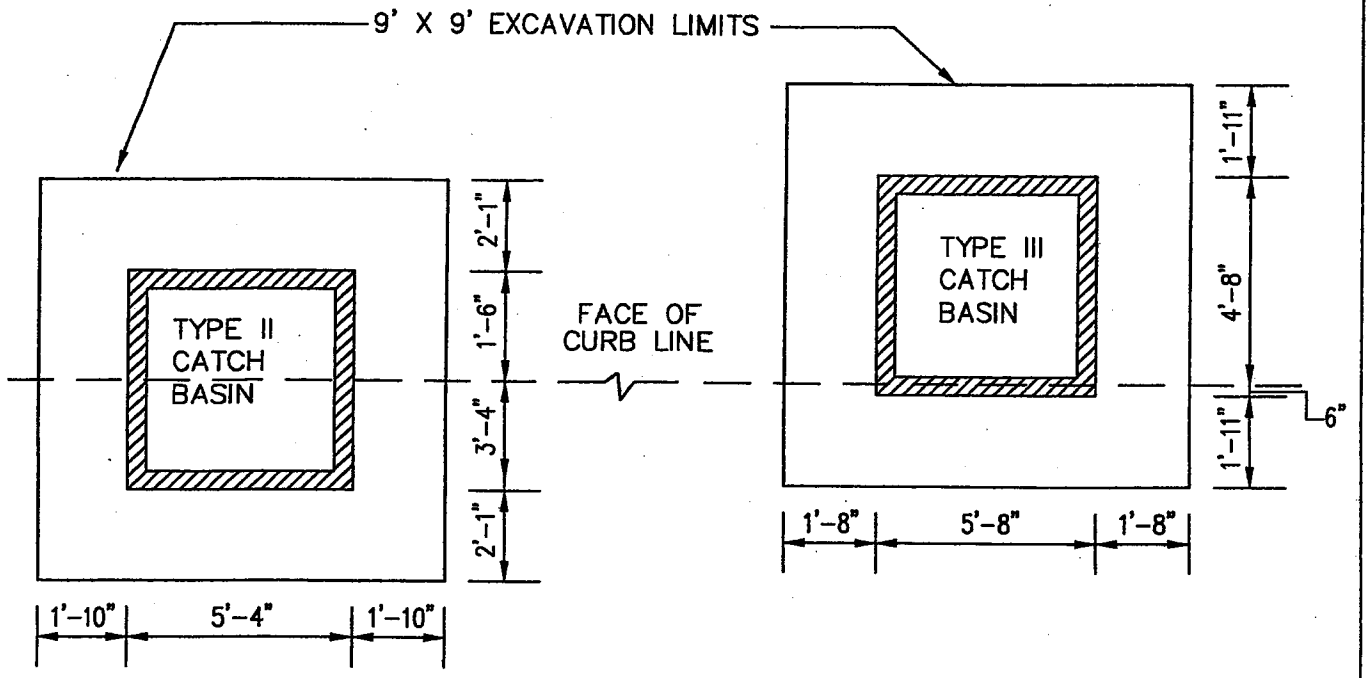


PROFILE

N.T.S.

NOTE:
VARIOUS ANGLES ARE AS DEFINED IN J.B. 200.

REVISIONS	J.B. SKETCH
	ACCOMODATIONS OF UTILITIES DURING CATCH BASIN CHUTE CONNECTION PIPE INSTALLATION
	CONTRACT NO. / SKETCH NO. J.B. 200 B



CATCH BASIN ORIENTATION TO CURB LINE WITH EXCAVATION LIMITS CONCENTRIC TO BASINS

N.T.S.

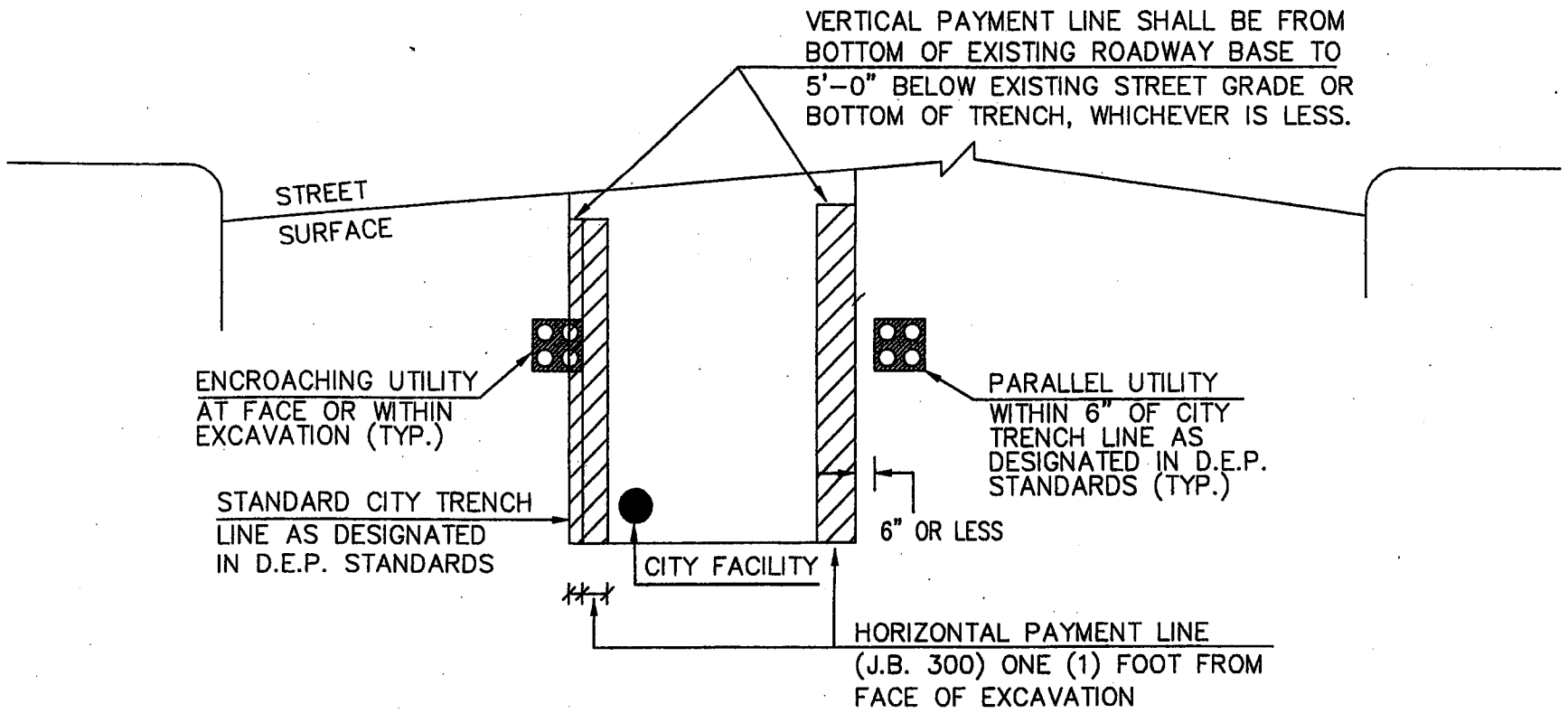
PAY LIMITS

CATCH BASIN TYPE	DIMENSION TO J.B. FACILITY PARALLEL FROM FACE OF CURB INTO STREET	DIMENSION TO J.B. FACILITY PARALLEL FROM FACE OF CURB INTO SIDEWALK	DIMENSION TO J.B. FACILITY PERPENDICULAR TO CURB FROM FACE OF CATCH BASIN
TYPE 2 TYPE 3	3'-6" TO 5'-5" 0'-8" TO 2'-5"	1'-8" TO 3'-7" 4'-10" TO 6'-7"	0'-2" TO 1'-10" 0'-2" TO 1'-8"

NOTES:

1. J.B. FACILITIES WILL NOT ACCEPT ANY PAYMENT LIABILITY BEYOND THE 9'x9' EXCAVATION LIMITS.
2. IN ADDITION, THE LIMIT OF EXCAVATION FOR NEW CATCH BASINS UNDER THIS CONTRACT SHALL NOT EXCEED A NINE (9') FOOT SQUARE AREA CONCENTRIC WITH THE CATCH BASIN AND NO ENLARGEMENT OF EXCAVATION WILL BE GRANTED FOR SHEETING. SUCH TRENCH WIDTH RESTRICTIONS, SPECIFIED ABOVE, FOR NEW CATCH BASINS AND CATCH BASIN CONNECTIONS MAY BE WAIVED UPON ENCOUNTERING AN OBSTRUCTION THAT NECESSITATES A SHIFT IN THE CATCH BASIN OR CONNECTION LOCATION, AS DIRECTED BY THE ENGINEER, AND THERE SHALL BE NO ADDITIONAL COST TO THE CITY FOR THE ENLARGEMENT OF THE EXCAVATION OR ADJUSTMENTS.

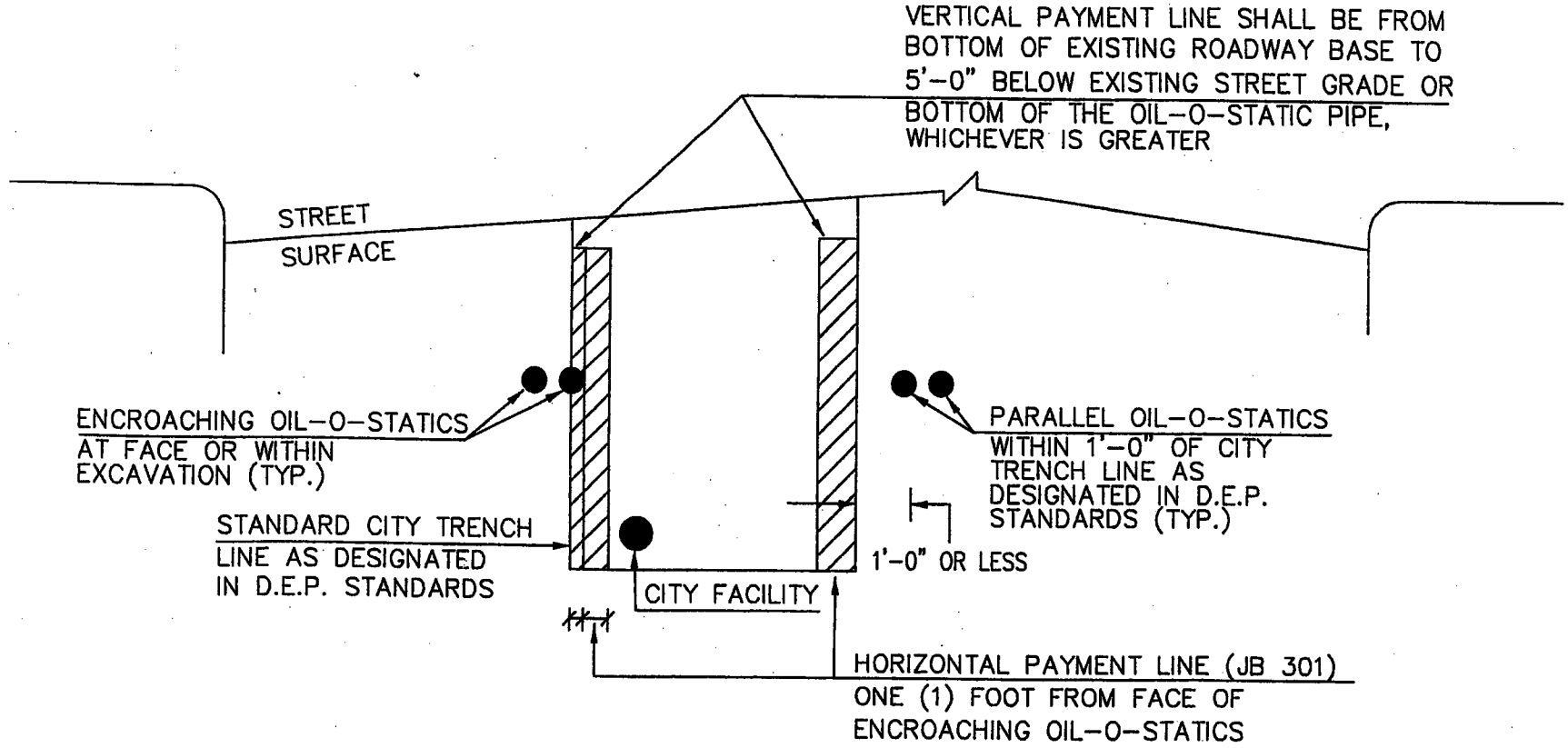
J.B. SKETCH	
INSTALLATION OF CATCH BASINS TO ACCOMODATE J.B. FACILITIES	
REVISIONS	
CONTRACT NO.	SKETCH NO. J.B. 225



PROFILE

N.T.S.

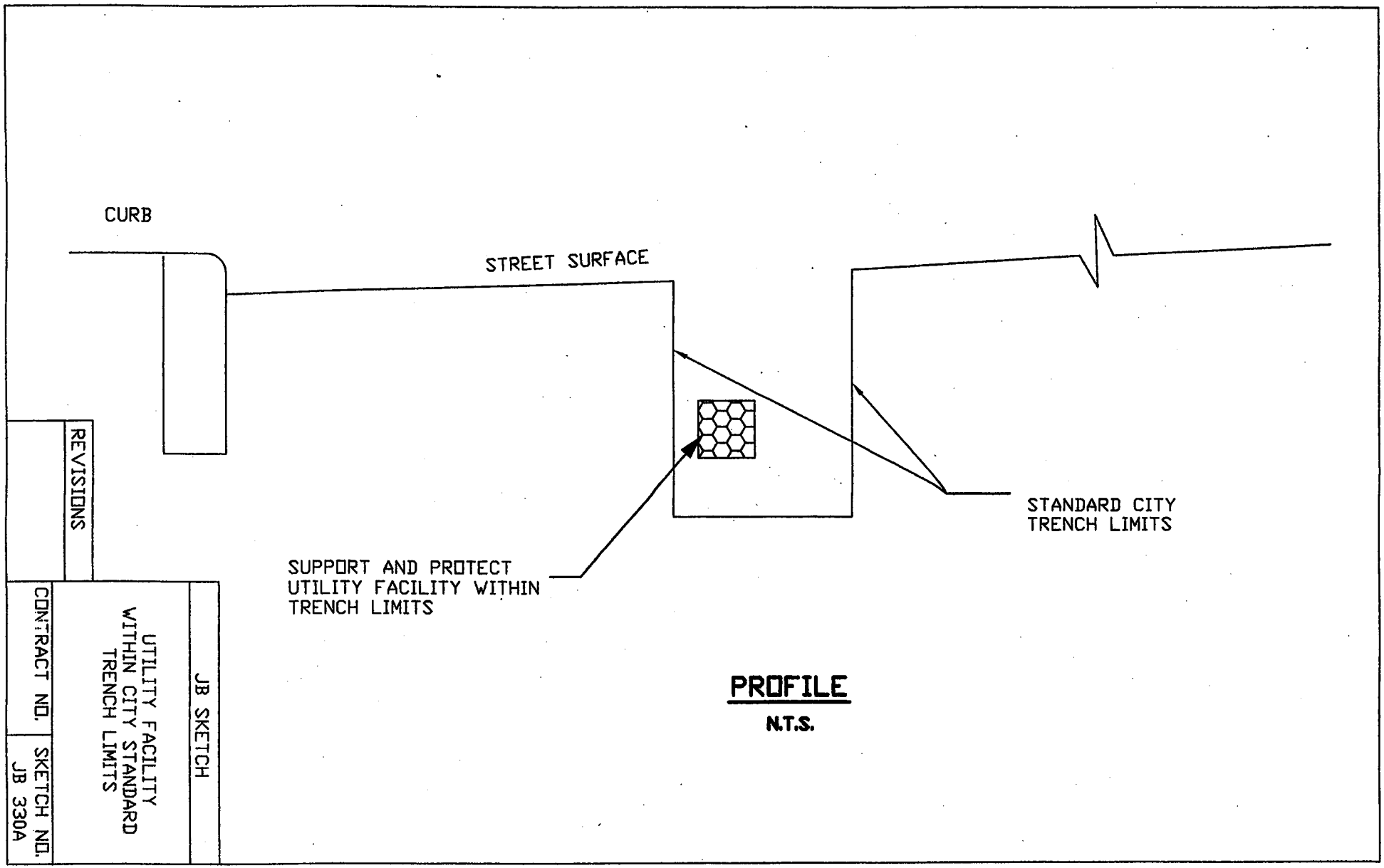
REVISIONS	J.B. SKETCH	CONTRACT NO.	SKETCH NO.
	UTILITY PARALLELING/ ENCROACHING IN CITY. FACILITY TRENCH		J.B. 300 A

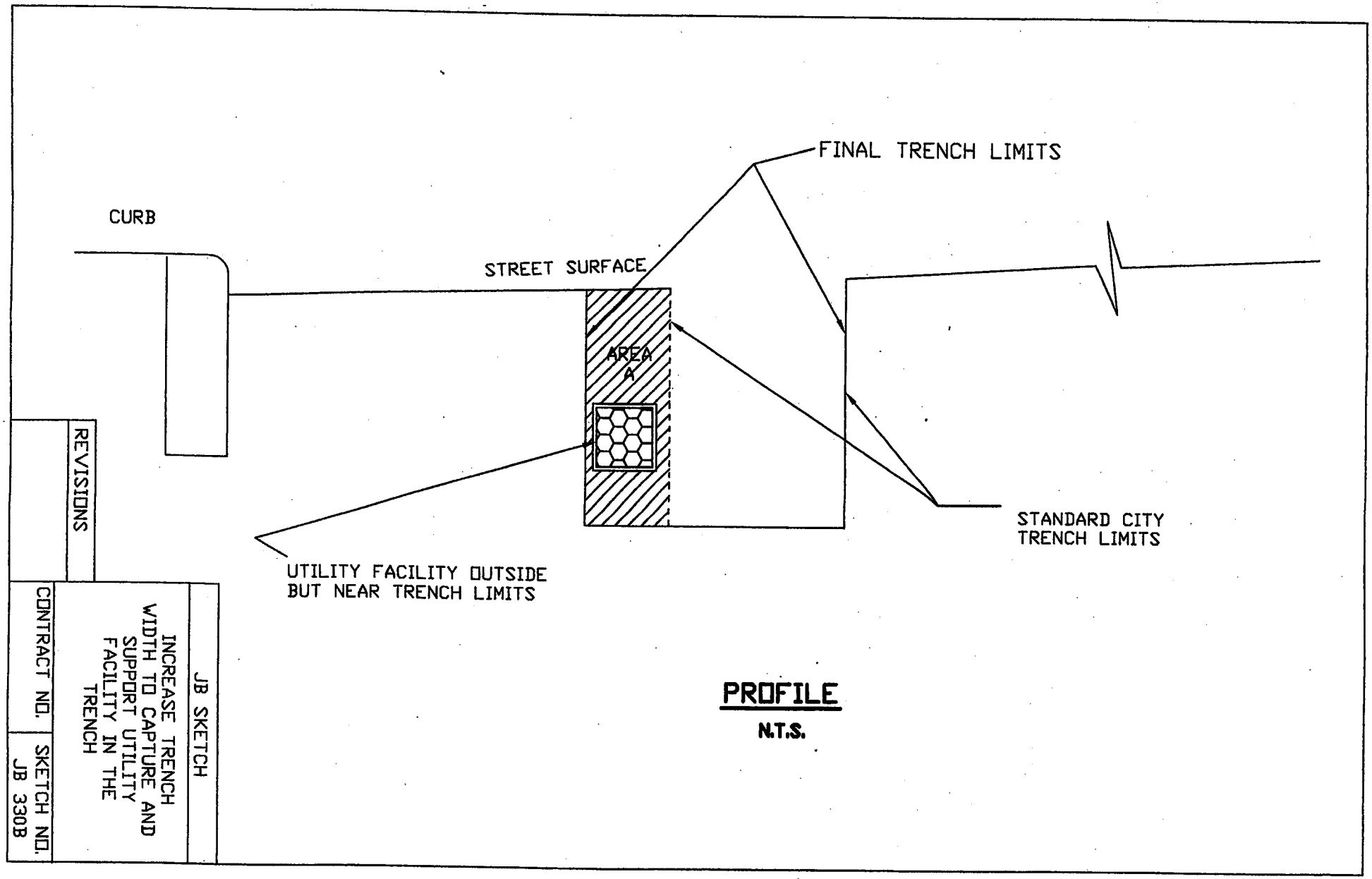


PROFILE

N.T.S.

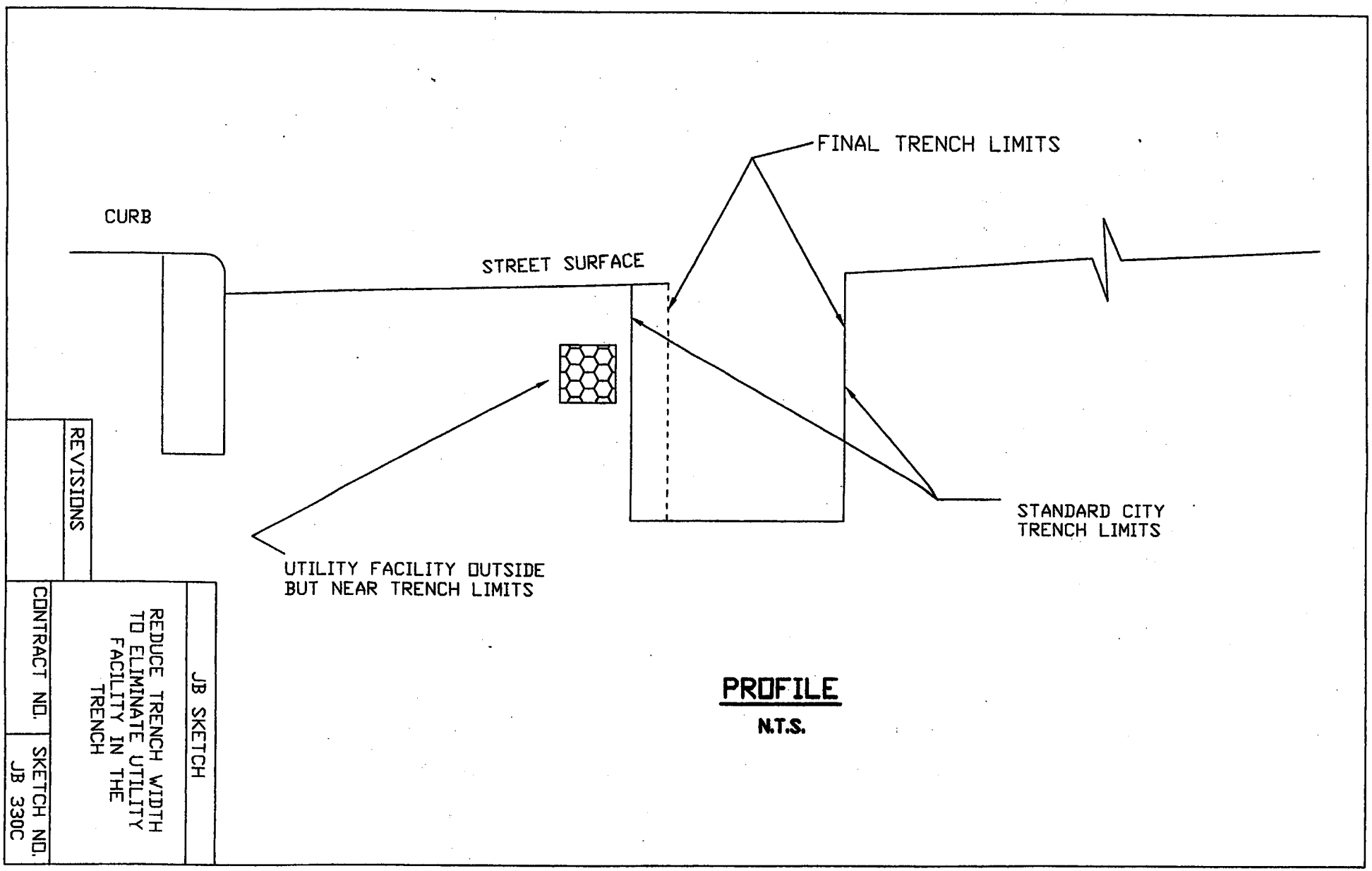
REVISIONS	JB SKETCH
	OIL-O-STATIC PIPES PARALLELING/ENCROACHING IN CITY FACILITY TRENCH
	CONTRACT NO.
	SKETCH NO. JB 301 A


CURB
STREET SURFACE
STANDARD CITY
TRENCH LIMITS
SUPPORT AND PROTECT
UTILITY FACILITY WITHIN
TRENCH LIMITS
PROFILE
N.T.S.
REVISIONS
CONTRACT NO.
SKETCH NO.
JB 330A
UTILITY FACILITY
WITHIN CITY STANDARD
TRENCH LIMITS
JB SKETCH


FINAL TRENCH LIMITS
CURB
STREET SURFACE
AREA A
STANDARD CITY TRENCH LIMITS
UTILITY FACILITY OUTSIDE BUT NEAR TRENCH LIMITS
REVISIONS
JB SKETCH
INCREASE TRENCH WIDTH TO CAPTURE AND SUPPORT UTILITY FACILITY IN THE TRENCH
CONTRACT NO.
SKETCH NO.
JB 330B

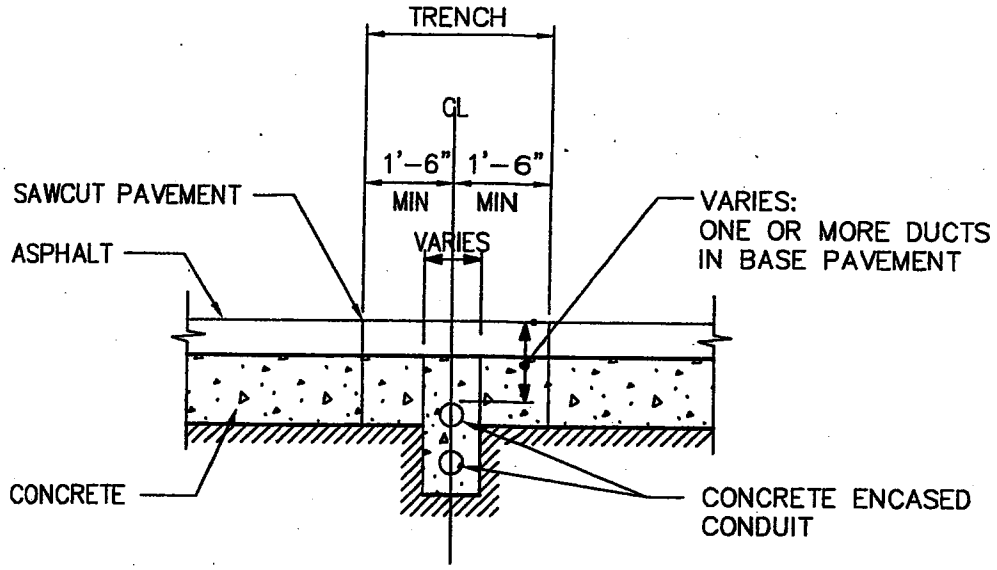
PROFILE

N.T.S.


FINAL TRENCH LIMITS
CURB
STREET SURFACE
STANDARD CITY
TRENCH LIMITS
UTILITY FACILITY OUTSIDE
BUT NEAR TRENCH LIMITS
REVISIONS
JB SKETCH
REDUCE TRENCH WIDTH
TO ELIMINATE UTILITY
FACILITY IN THE
TRENCH
CONTRACT NO.
SKETCH NO.
JB 330C

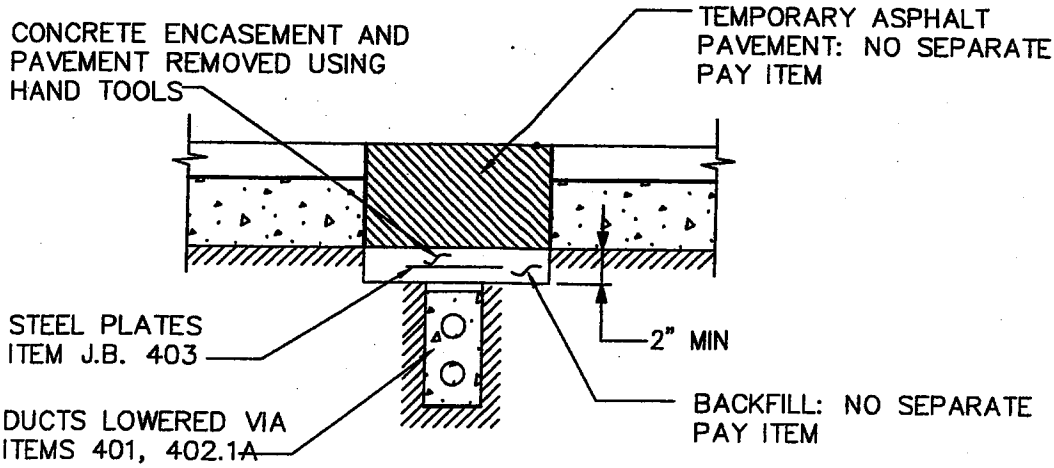
PROFILE

N.T.S.



DUCTS WITHIN BASE PAVEMENT
EXISTING TYPICAL SECTION

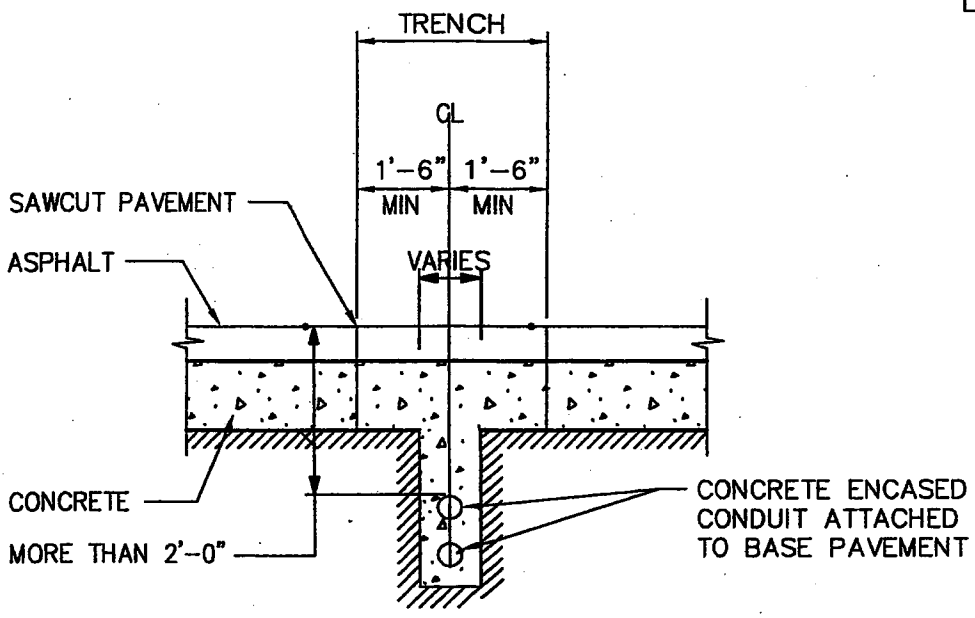
N.T.S.



DUCTS WITHIN BASE PAVEMENT
PROPOSED TYPICAL SECTION

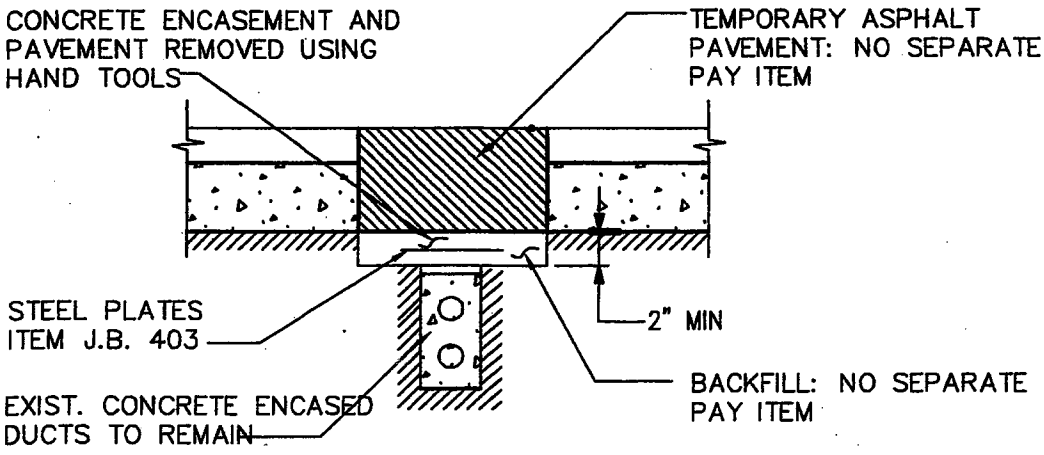
N.T.S.

J.B. SKETCH	
SPECIAL CARE PAVEMENT EXCAVATION FOR ADJUSTMENT OF CABLE TV. FACILITIES CONNECTED TO THE BASE PAVEMENT	
REVISED	CONTRACT NO. / SKETCH NO. J.B. 401AC



DUCTS BELOW BASE PAVEMENT
EXISTING TYPICAL SECTION

N.T.S.



DUCTS BELOW BASE PAVEMENT
PROPOSED TYPICAL SECTION

N.T.S.

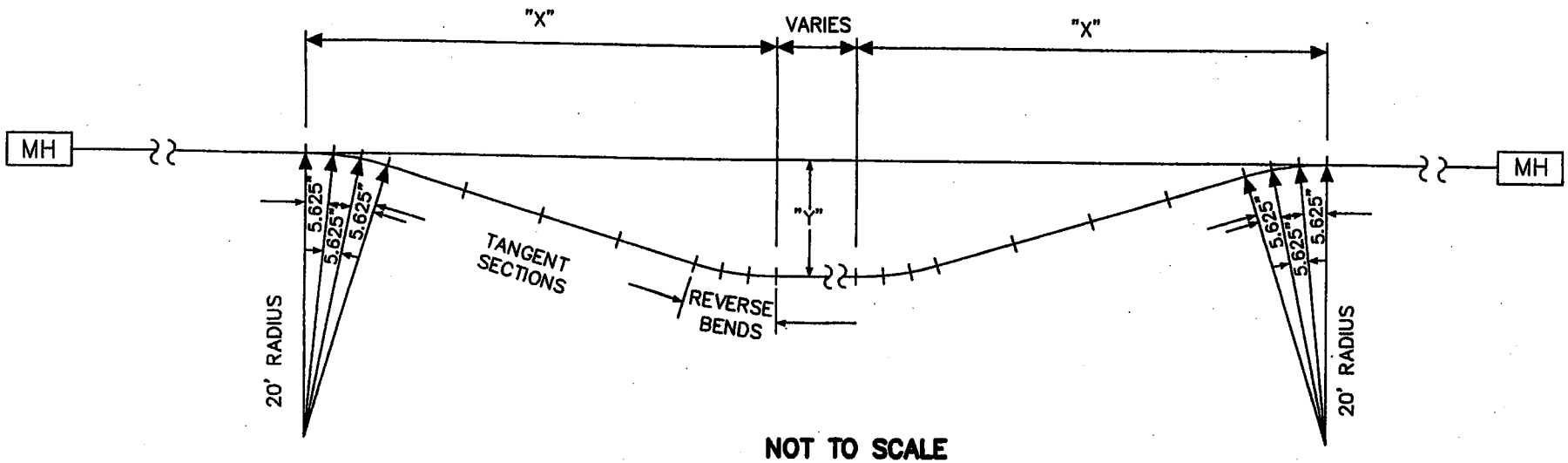
J.B. SKETCH

SPECIAL CARE PAVEMENT EXCAVATION FOR ADJUSTMENT OF CABLE TV. FACILITIES CONNECTED TO THE BASE PAVEMENT

REVISED

CONTRACT NO.

SKETCH NO. J.B. 401AC2



NOT TO SCALE

"Y" OFFSET OF DUCT AXIS	COMBINATION OF 20' RADIUS-- BEND SECTIONS AND TANGENT SECTIONS			"X" HORIZONTAL & VERTICAL DISTANCE FROM START OF OFFSET TO POINT OF MAXIMUM OFFSET
	BEND	TANGENT	REV. BEND	
0.8 FEET	2	0	2	7.8 FEET
1.7 FEET	3	0	3	11.6 FEET
2.9 FEET	3	1	3	15.4 FEET
4.1 FEET	3	2	3	19.3 FEET
5.2 FEET	3	3	3	23.1 FEET
6.4 FEET	3	4	3	26.9 FEET

BEND SECTIONS ARE 20' RADIUS, 5' 5/8" LONG.
TANGENT SECTIONS ARE 4' LONG STRAIGHT.

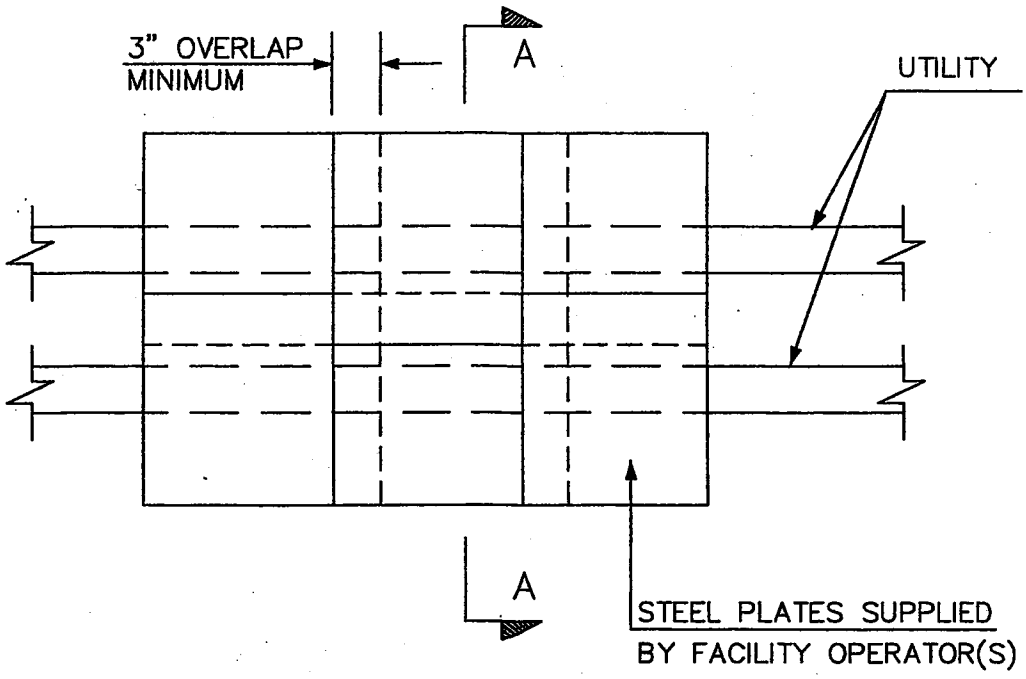
REVISIONS

CONTRACT NO.

SKETCH NO. J.B. 402 A

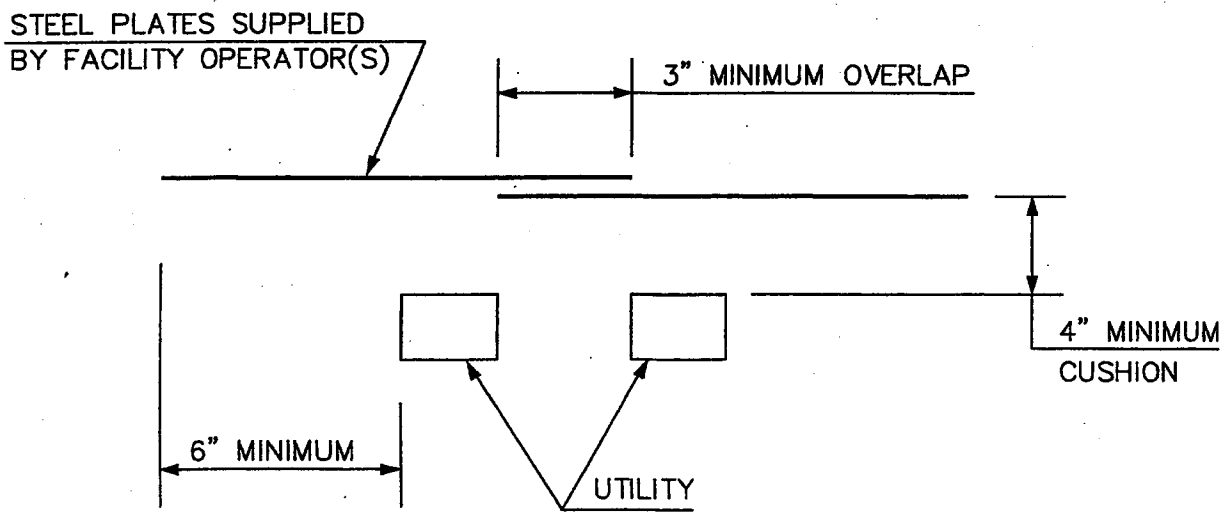
HORIZONTAL/VERTICAL ADJUSTMENTS FOR ELECTRIC

J.B. SKETCH



PLAN

NOT TO SCALE

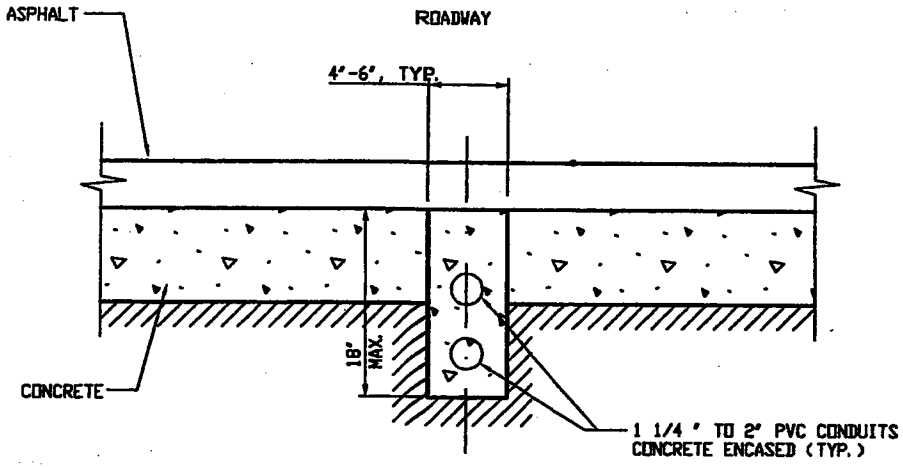


SECTION A–A

NOT TO SCALE

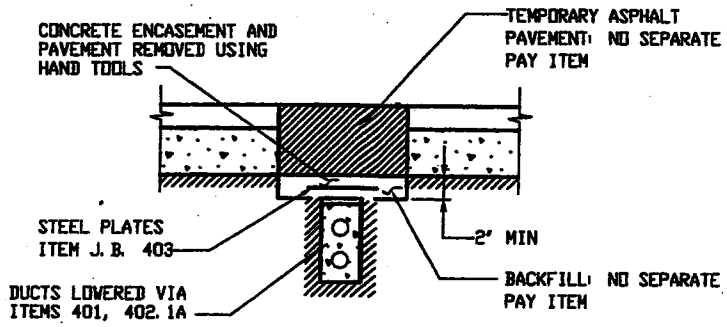
TYPICAL PLATE SIZES:
15" x 21" x 3/8"
16" x 24" x 3/8"
21" x 27" x 3/8"

REVISIONS	J.B. SKETCH
	PLACING STEEL PROTECTION PLATES FOR ELECTRIC AND COMMUNICATION FACILITIES
	CONTRACT NO. / SKETCH NO. J.B. 403 A



TYPICAL SECTION: CABLE TELEVISION DUCTS ATTACHED TO BASE PAVEMENT

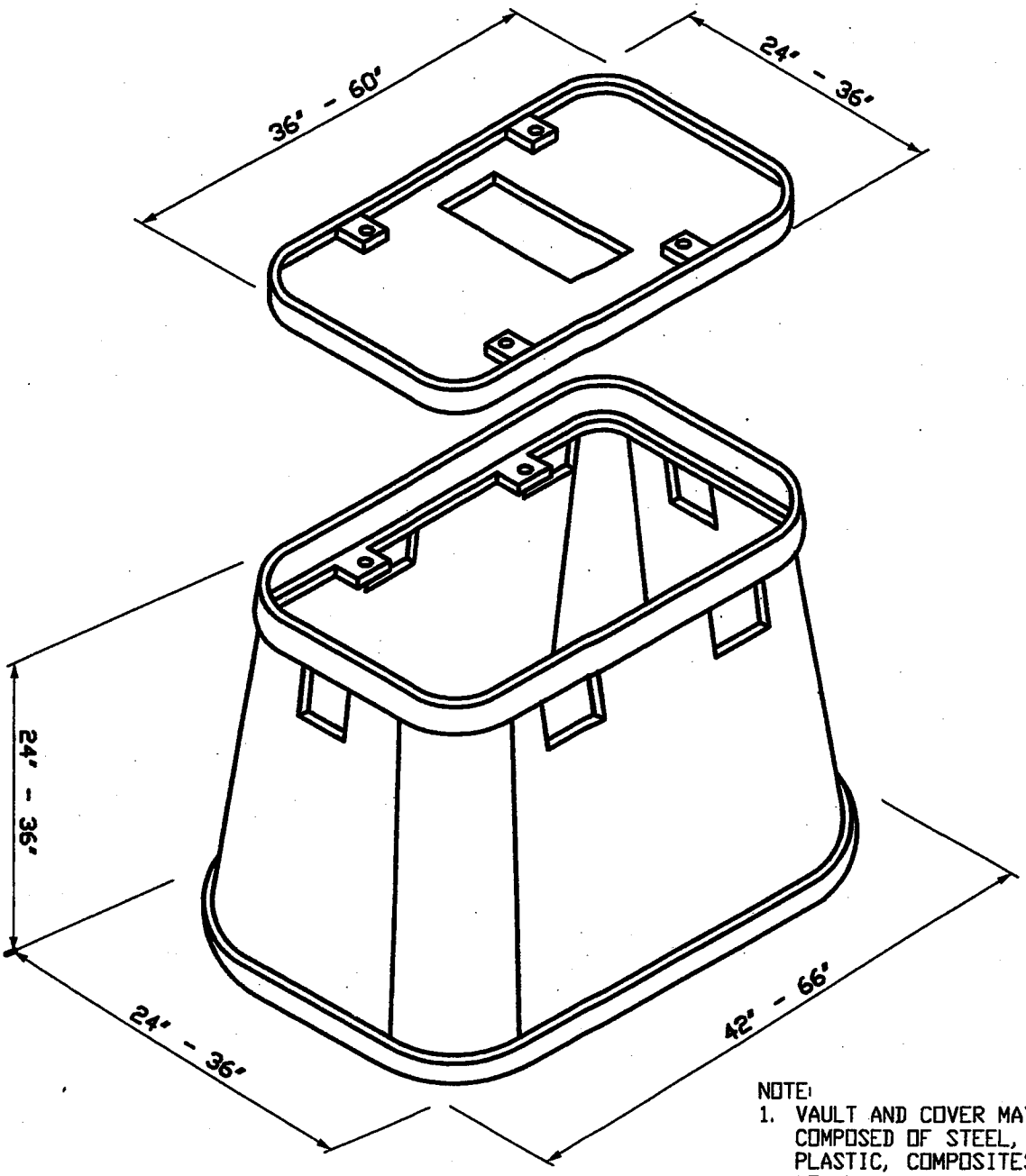
N.T.S.



DUCTS WITHIN BASE PAVEMENT PROPOSED TYPICAL SECTION

N.T.S.

J.B. SKETCH	
CABLE TELEVISION DUCT BANK ATTACHED TO BASE PAVEMENT (TYPICAL)	
NEW	
CONTRACT NO.	SKETCH NO. J.B. 500.1



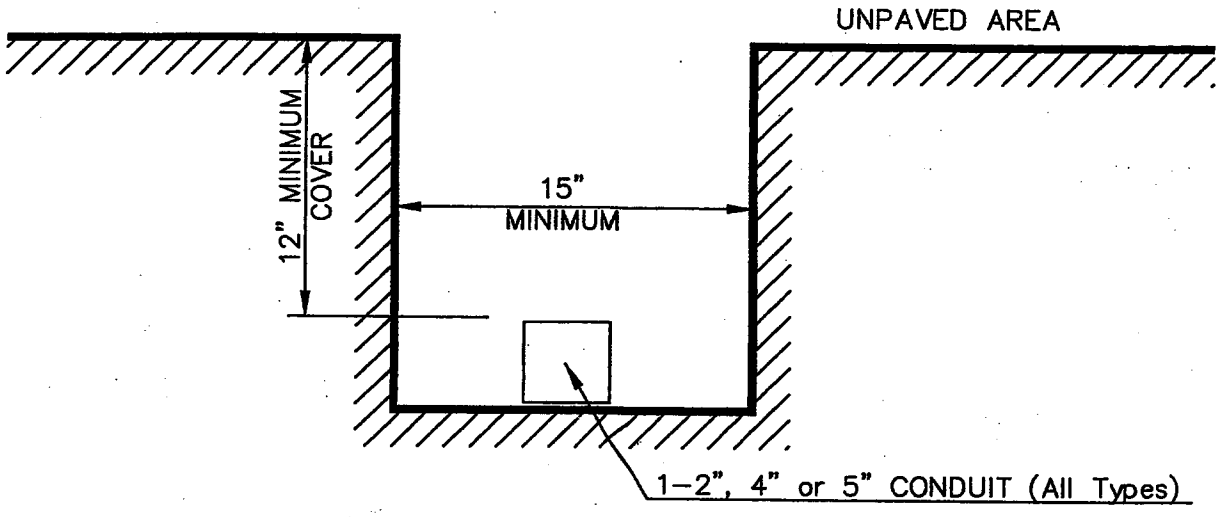
NOTE:
1. VAULT AND COVER MAY BE COMPOSED OF STEEL, PLASTIC, COMPOSITES AND/OR POLYMER CONCRETE MATERIALS

2. VAULT BOTTOMS ARE OPEN-ENDED AND FILLED WITH GRAVEL

CABLE TELEVISION SIDEWALK VAULT - TYPICAL

NTS

J.B. SKETCH	
CABLE TELEVISION SIDEWALK VAULT (TYPICAL)	
REVISIONS	
CONTRACT NO.	SKETCH NO. J.B. 501.1



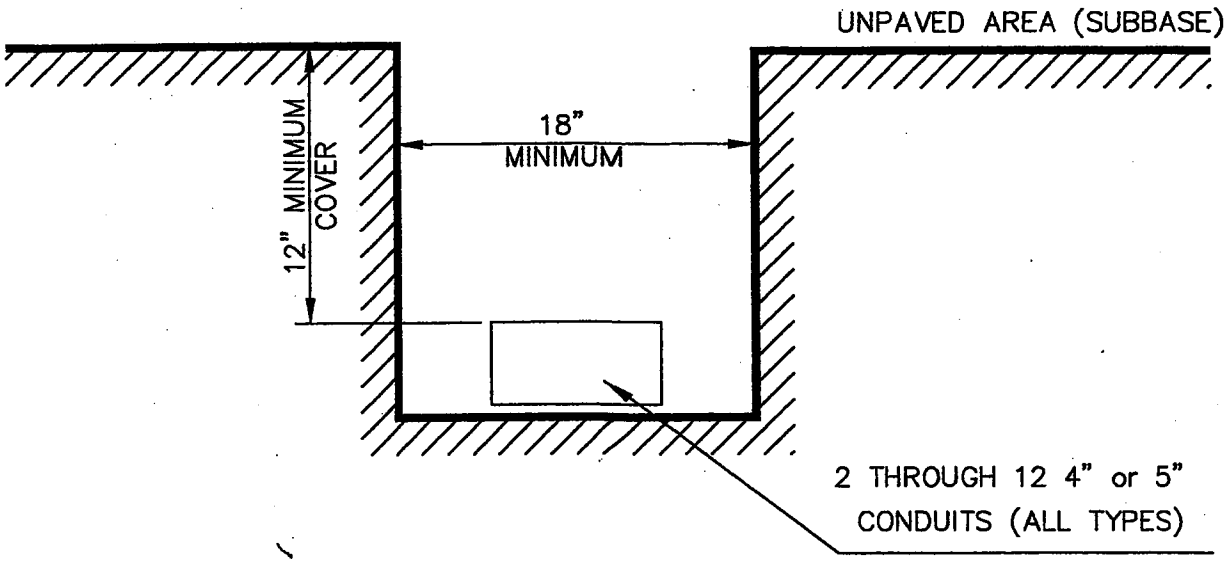
EXCAVATION OF THE TRENCH –

THE BOTTOM OF THE TRENCH SHALL BE GRADED SMOOTH AND TAMPED TO MINIMIZE INITAL SETTLEMENT AND TO AVOID "POINT" SUPPORT OF CONDUITS. ALL STONES PROJECTING INTO THE TRENCH SHALL BE REMOVED FROM THE TRENCH BOTTOM AND THE VOIDS BACKFILLED BEFORE CONDUIT INSTALLATION. THE CONDUIT INSTALLATION SHALL BE IN AS STRAIGHT ALIGNMENT AS POSSIBLE WITH CONTINUOUS CONCENTRIC BORES AND FLUSH JOINTS TO PERMIT SMOOTH, EASY PULLING OF CABLE WITHOUT DAMAGE. THE INTERIOR OF THE CONDUIT MUST BE FREE OF IMPERFECTIONS AND CARE SHALL BE EXERCISED TO PREVENT INTRODUCTION OF FOREIGN MATERIAL.

COUPLINGS –

SLIP OR PLASTIC COUPLINGS SHALL BE USED AS REQUIRED, TO JOIN ALL CONDUIT.

J.B. SKETCH	
TRENCH EXCAVATION FOR 1–2", 4" or 5" CONDUIT (All Types)	
REVISIONS	
CONTRACT NO.	SKETCH NO. J.B. 603E.1



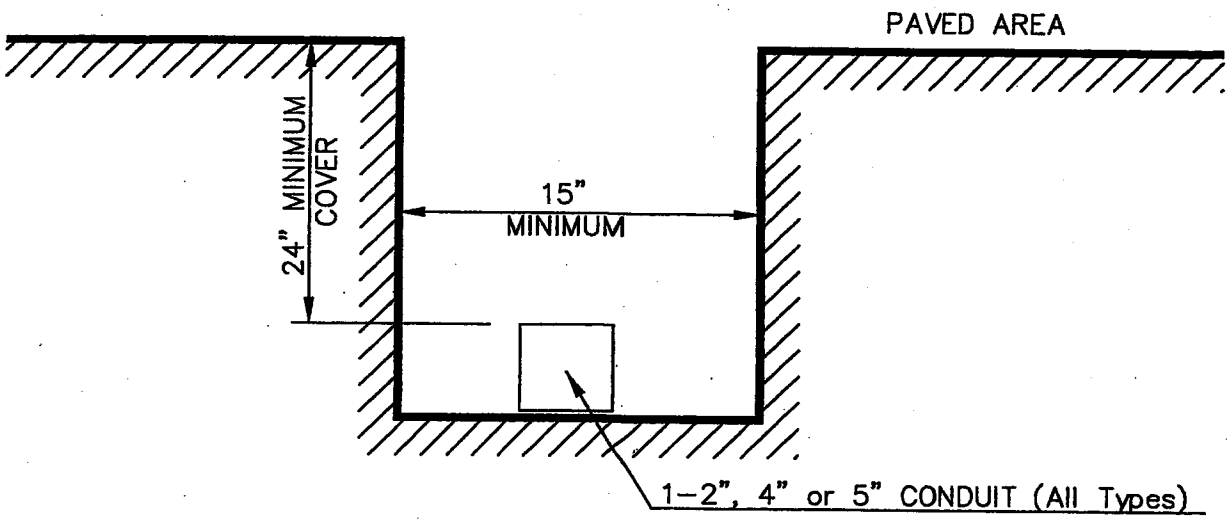
EXCAVATION OF THE TRENCH –

THE BOTTOM OF THE TRENCH SHALL BE GRADED SMOOTH AND TAMPED TO MINIMIZE INITAL SETTLEMENT AND TO AVOID "POINT" SUPPORT OF CONDUITS. ALL STONES PROJECTING INTO THE TRENCH SHALL BE REMOVED FROM THE TRENCH BOTTOM AND THE VOIDS BACKFILLED BEFORE CONDUIT INSTALLATION. THE CONDUIT INSTALLATION SHALL BE IN AS STRAIGHT ALIGNMENT AS POSSIBLE WITH CONTINUOUS CONCENTRIC BORES AND FLUSH JOINTS TO PERMIT SMOOTH, EASY PULLING OF CABLE WITHOUT DAMAGE. THE INTERIOR OF THE CONDUIT MUST BE FREE OF IMPERFECTIONS AND CARE SHALL BE EXERCISED TO PREVENT INTRODUCTION OF FOREIGN MATERIAL.

COUPLINGS –

PLASTIC COUPLINGS SHALL BE USED TO JOIN ALL CONDUIT.

	JB SKETCH
	TRENCH EXCAVATION FOR 2 Through 12 Conduits (ALL TYPES)
REVISIONS	
	CONTRACT NO. / SKETCH NO. J.B. 603E.2



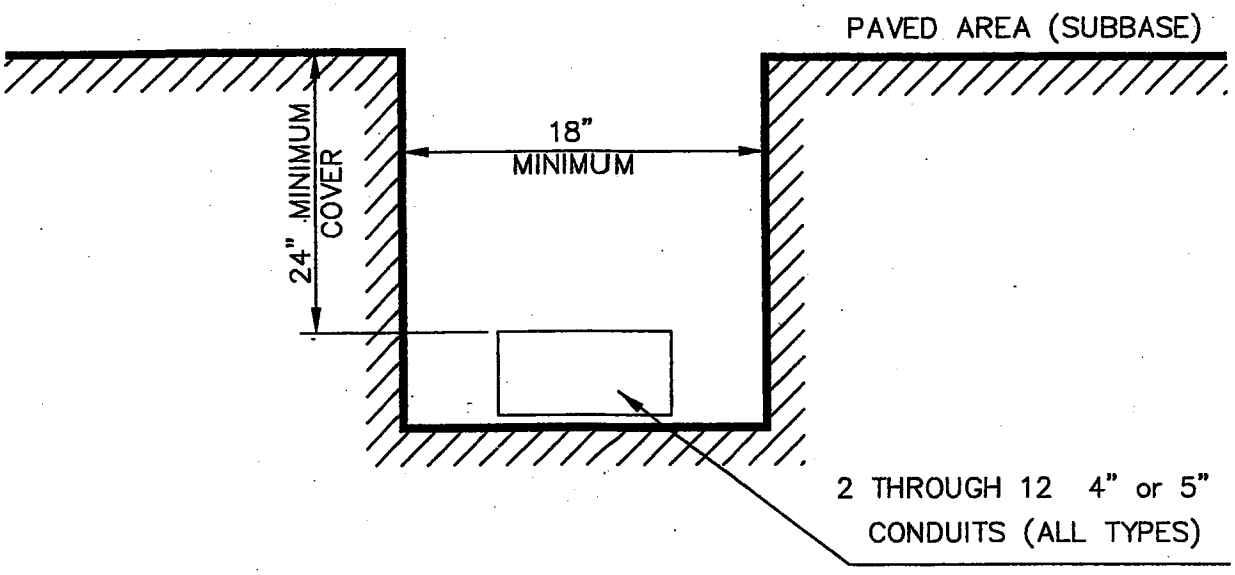
EXCAVATION OF THE TRENCH –

THE BOTTOM OF THE TRENCH SHALL BE GRADED SMOOTH AND TAMPED TO MINIMIZE INITAL SETTLEMENT AND TO AVOID "POINT" SUPPORT OF CONDUITS. ALL STONES PROJECTING INTO THE TRENCH SHALL BE REMOVED FROM THE TRENCH BOTTOM AND THE VOIDS BACKFILLED BEFORE CONDUIT INSTALLATION. THE CONDUIT INSTALLATION SHALL BE IN AS STRAIGHT ALIGNMENT AS POSSIBLE WITH CONTINUOUS CONCENTRIC BORES AND FLUSH JOINTS TO PERMIT SMOOTH, EASY PULLING OF CABLE WITHOUT DAMAGE. THE INTERIOR OF THE CONDUIT MUST BE FREE OF IMPERFECTIONS AND CARE SHALL BE EXERCISED TO PREVENT INTRODUCTION OF FOREIGN MATERIAL.

COUPLINGS –

SLIP OR PLASTIC COUPLINGS SHALL BE USED AS REQUIRED, TO JOIN ALL CONDUIT.

	J.B. SKETCH
	TRENCH EXCAVATION FOR 1-2", 4" or 5" CONDUIT (ALL TYPES)
NEW	
	CONTRACT NO. / SKETCH NO. J.B.-603E.3



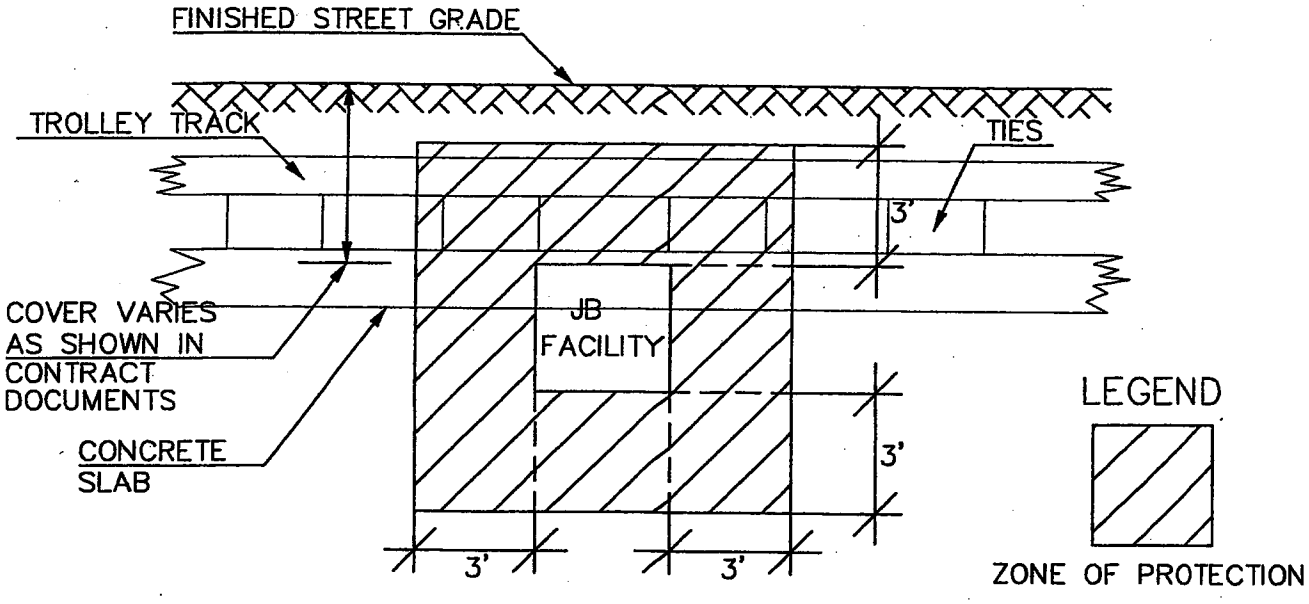
EXCAVATION OF THE TRENCH –

THE BOTTOM OF THE TRENCH SHALL BE GRADED SMOOTH AND TAMPED TO MINIMIZE INITAL SETTLEMENT AND TO AVOID "POINT" SUPPORT OF CONDUITS. ALL STONES PROJECTING INTO THE TRENCH SHALL BE REMOVED FROM THE TRENCH BOTTOM AND THE VOIDS BACKFILLED BEFORE CONDUIT INSTALLATION. THE CONDUIT INSTALLATION SHALL BE IN AS STRAIGHT ALIGNMENT AS POSSIBLE WITH CONTINUOUS CONCENTRIC BORES AND FLUSH JOINTS TO PERMIT SMOOTH, EASY PULLING OF CABLE WITHOUT DAMAGE. THE INTERIOR OF THE CONDUIT MUST BE FREE OF IMPERFECTIONS AND CARE SHALL BE EXERCISED TO PREVENT INTRODUCTION OF FOREIGN MATERIAL.

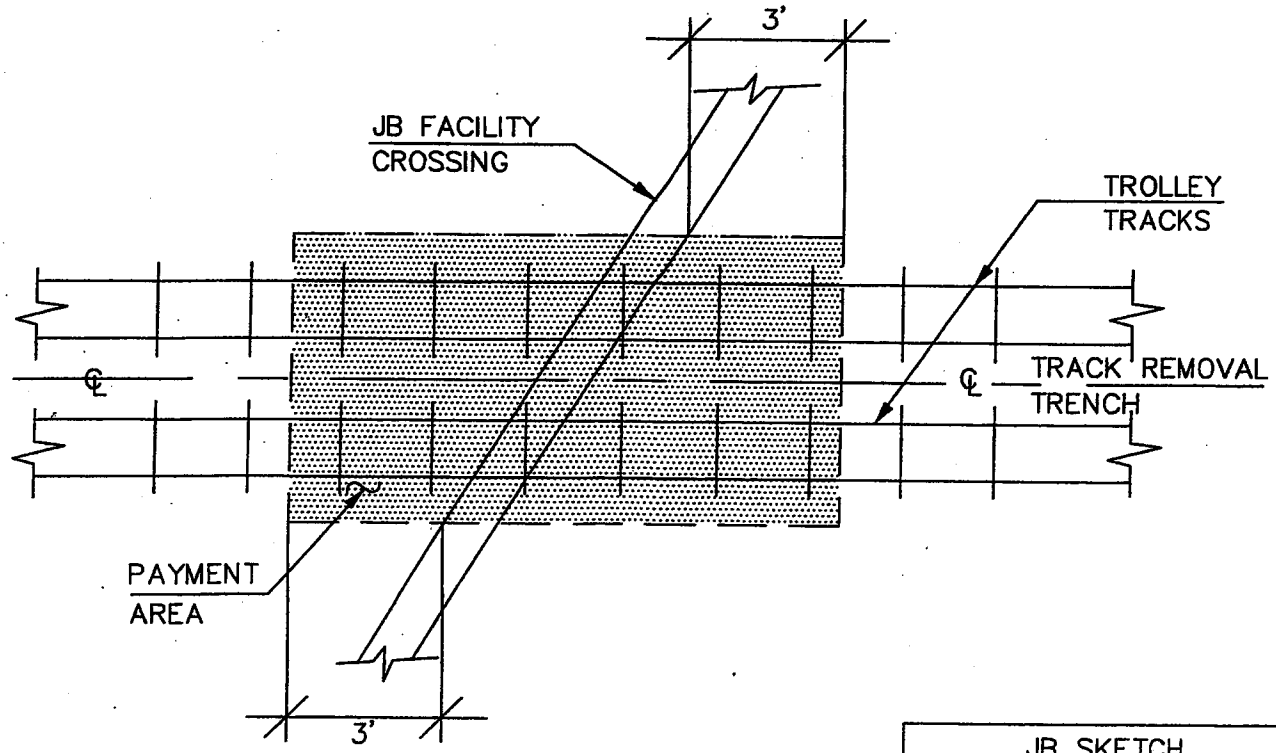
COUPLINGS –

PLASTIC COUPLINGS SHALL BE USED TO JOIN ALL CONDUIT.

	J.B. SKETCH	
	TRENCH EXCAVATION FOR 2 Through 12 Conduits (ALL TYPES)	
NEW	CONTRACT NO.	SKETCH NO. J.B.–603E.4



SECTION OF JB FACILITIES CROSSING TROLLEY TRACKS



PLAN OF JB FACILITIES CROSSING TROLLEY TRACKS

REVISIONS	JB SKETCH
	JB ACCOMODATION SECTIONS AT TROLLEY RAILROAD STRUCTURES
	CONTRACT NO. / SKETCH NO. J.B. 800–A