

EARTHWORK

I. EXCAVATIONS

I.1. EXCAVATIONS

Excavations shall be made in conformance with the latest revision of "Part II, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926, Occupational Safety and Health Standards - Excavations; Final Rule, Subpart P".

I.2. SAFETY DATA

Bench Marks and other reference points shall be carefully maintained and protected.

I.3. UNDERMINING

The Builder shall provide such dewatering, sheeting, and shoring as may be required to support the sides of any excavation to prevent earth movement that could endanger the work, workmen, or any existing structures, or to confine the construction within a specified area, so that all work may be accomplished and inspected in the dry.

I.4. TEMPORARY ACCESS

Suitable safe temporary bridges, crossings, or access ways shall be provided during construction to maintain traffic and/or provide access to private property. Such structures shall be removed after construction is complete.

I.5. DUST CONTROL

Dust conditions shall be kept to a minimum via a method to be approved by the Engineer.

I.6. OTHER UTILITIES

Prior to opening an excavation the Builder shall notify other utilities and actual field locations shall be made of their facilities except new URD construction where "As-Builts" are furnished by the Developer. Overhead and underground utilities shall be properly protected by acceptable methods at all times during construction.

I.7. HAND EXCAVATION

The Builder shall excavate by hand where excavation by machinery would endanger trees, structure or utilities unless prior arrangements have been made.

I.8. OPEN EXCAVATION

The extent of excavation open at any one time will be held to a minimum consistent with the orderly prosecution of the work. All trench excavation will be open cut unless tunneling is specified by the Engineer.

I.9. EXCAVATED MATERIAL

Such material to be used for backfill shall be neatly deposited. Where stockpiling is required, the Builder shall be responsible for obtaining the sites and shall so maintain his operations to provide for natural drainage and not present an unsightly appearance. Materials unsuitable for backfill shall be removed from the job site and disposed of by the Builder.

I.10. BEDDING

Except where granular bedding is to be used mechanical excavation shall be stopped above the final grade elevation and the remaining material carefully hand excavated so that the conduit or structure may be constructed on a firm, undisturbed, native earth bed. In the event

excavation below the elevation required is made, bedding material will be placed and compacted to bring the excavation to grade.

I.11. **BAD MATERIAL**

If unstable or unsuitable material is encountered at or below the limits of excavation, such material shall be removed and replaced with suitable material compacted as specified, when specifically authorized by the Engineer.

I.12. **ROCK**

If rock is encountered, excavation shall be made to at least 6 inches below the finish grade of the structure or conduit. The resultant over excavation shall be filled and compacted with suitable bedding material.

II. BACKFILL

II.1. **GENERAL**

II.1.1. The Builder shall be responsible for obtaining the necessary inspections, "As-Builts", and compaction tests, before, during, and after backfilling.

II.1.2. He shall re-excavate, refill and perform all such related work necessary to obtain satisfactory backfill results.

II.2. **MATERIAL**

Excavated native granular material free from perishable and objectionable objects such as roots, rocks, bricks, concrete, etc. and containing no stones or clods larger than 3 inches in diameter shall be used for backfilling. Excess or unsuitable backfill material will be disposed of by the Builder.

II.3. **RAMPING**

All backfill shall be placed in uniform horizontal layers, "Ramping", that is pushing backfill materials down a ramp into excavated area will not be permitted.

II.4. **WHEN**

Backfill shall be accomplished as soon as practicable after underground work on the conduit or structure is completed and inspected. No trash shall be allowed to accumulate in the space to be backfilled.

III. COMPACTION

III.1. **GENERAL**

The below listed compaction requirements are in conformance with the City Standard Specifications for the City of Jacksonville, Florida of October, 1978 as amended. Specifications for work within State Road Rights-of-Way are in conformance with Requirements Paragraph 125-8.3.2 of the 1982 edition of the FDOT Standard Specifications for Road and Bridge Construction. If either or both of these specifications have been revised, the latest revision shall apply.

III.2. **TESTING**

An approved independent testing laboratory shall be retained to make in-place density tests of trench backfill at intervals of not more than 150 feet for each compacted lift along all conduit. Reports of these tests shall be submitted in triplicate within 24 hours to the Engineer for approval.

III.3. METHOD

The method of compacting backfill material shall be at the Builder's option provided the compaction requirements herein specified are obtained, except that consolidation by flooding will not be permitted under or adjacent to paved or unpaved traffic areas.

IV. COMPACTION WITHIN CITY RIGHT-OF-WAY

IV.1. TO TOP OF CONDUIT:

Backfill material up to the top of conduit shall be placed in layers not to exceed 6 inches compacted thickness and compacted to 100 percent (100%) of its maximum density at + 2% of optimum moisture content as determined by the Laboratory Modified Proctor Test (AASHTO-T-180). A tolerance of minus two percent (-2%) shall be allowed in the compactive effort.

IV.2. UNDER ROADS:

In paved or unpaved roadways and traffic areas including road shoulders, railroad crossings, driveways and within the right-of-way, backfill material above the top of conduit and above the bottom of structures, shall be placed in layers not to exceed 12 inches loose thickness and compacted to 98 percent (98%) of its maximum density at + 2% of optimum moisture content as determined by the Laboratory Modified Proctor Test (AASHTO-T-180).

IV.3. NOT UNDER ROADS:

In areas outside of roadways and outside of the right-of-way, backfill material above one foot over the top of conduit and above the bottom of structures shall be placed in layers not to exceed 12 inches compacted thickness.

IV.4. ON FILL:

Where conduit is laid or structures built on fill materials in lieu of undisturbed earth, the fill material shall be brought up to the bottom elevation of the conduit or structure in 6 inch maximum layers compacted thickness. Each layer shall be compacted to 100 percent (100%) of the maximum density as determined by the Laboratory Modified Proctor Test (AASHTO-T-180). A tolerance of minus two percent (-2%) shall be allowed in the compactive effort.

V. COMPACTION WITHIN STATE ROAD RIGHT-OF-WAY

V.1. APPLICATION:

As exception to the above paragraph, the following shall govern work within State Road Rights-of-Ways.

V.2. TO TOP OF CONDUIT:

Backfill material up to the top of conduit, and up to the bottom of structures, shall be placed in layers not to exceed 6 inches (compacted thickness) and compacted to 100 percent (100%) of its maximum density at + 2% of optimum moisture content as determined by AASHTO-T-99. No minus tolerance shall be allowed in the compactive effort.

V.3. UNDER ROADS:

When pavement is to be constructed over the conduit backfill material above the top of the conduit and above the bottom of structures shall be placed in the manner and compacted to the degree required in Paragraph E.2 above. No minus tolerance shall be allowed in the compactive effort.

V.4. 5.4. NOT UNDER ROADS:

Where no pavement is to be constructed and vehicular traffic is not to pass over the conduit, backfill material above the top of the conduit and above the bottom of structures shall be compacted to a firmness approximately equal to that of the soil adjacent to the conduit trench or structure excavation.

VI. BASE COURSE**VI.1. APPLICATION**

The base course shall consist of a layer of granular material (Krush Krete™) intended to serve as a foundation for and to replace unstable or unsatisfactory bedding material.

Where indicated, excavation for concrete encased duct bank and structures shall be made to allow for construction of a base course. The compacted thickness of this base is to be as indicated in the Project Documents. The width of this base shall extend one foot (1') to either side of the concrete encased duct bank.

The base under structures shall extend eighteen inches (18") beyond the perimeter of the structure, unless otherwise specified.

VI.2. MATERIAL

Base course shall consist of well-graded crushed stone, crushed gravel or crushed concrete (crushcrete) meeting the specification of ASTM C33, gradation 7 (1/2 in. to No. 4).

NOTE: If crushed concrete is used, a written certification and guarantee shall be provided from the material supplier pertaining to the cleanliness of the material. The material shall not contain any foreign objects, contamination or hazardous materials. Material found to be unsatisfactory shall be removed and replaced with satisfactory material at the builder's expense.

VI.3. COMPACTION

Base course granular fill material to be compacted shall be placed in layers not over six inches (6") thick, and each layer shall be thoroughly compacted with mechanical vibrators to a relative density of 80% as obtained from ASTM-2049.

VII. SHEETING, SHORING AND BRACING**VII.1. GENERAL**

VII.1.1. The Builder shall provide and install such sheeting and shoring as may be required to support the sides of any excavation to prevent earth movement that could endanger the work or workman, or any existing structures, or to confine the construction within a specified area such as an easement or street right-of-way.

VII.1.2. It shall be the Builder's responsibility to place this sheeting and shoring for such protective purposes without the Owner's instructions.

VII.2. DESIGN

Supporting systems, i.e., sheet piling, cribbing, shoring, etc., shall be designed by a qualified person and meet accepted engineering requirements.

VII.3. SHEET PILE INSTALLATION

Installation of sheet piling by the use of vibratory type pile drivers will not be done without the specific permission of the Engineer.

VII.4. SHEET PILE EXTRACTION

Extraction of sheet piling by the use of vibratory type pile drivers will not be done without the specific permission of the Engineer. The use of vibratory pile drivers shall be limited to that sheet piling driven no greater than five (5) feet below the bottom of the structure or duct bank. Sheet pile may be completely removed when sufficient backfill has been placed to prevent damage to the work and/or existing structures. All voids left shall be immediately backfilled and compacted.

VII.5. TIMBER SHEETING LEFT IN PLACE

Timber sheet pile may be left in place when it is used as the outer form for a cast-in-place structure. Such sheet pile shall have been treated prior to driving. The sheet pile shall be cut off.

VII.6. STEEL SHEETING LEFT IN PLACE

Steel sheeting left in place shall be limited to that sheeting more than five (5) feet below the bottom of a structure or duct bank grade which cannot be removed except with a vibratory pile driver. Such piling shall be cut off no less than thirty (30) inches below grade and left in place.

VIII. ADDITIONAL PLATE(S)

Listed below are plates not otherwise covered by a construction standard plate and drawing.

PLATE	DESCRIPTION	UNIT
BASE-COURSE	Stone/Gravel Base Course	CY
MBASE-COURSE	Stone/Gravel Base Course	CY
BKFL	Place Select Backfill, Uncompacted	CY
MBKFL	Place Select Backfill, Uncompacted	CY
BKFL-COMP	Place & Compact Select Backfill	CY
MBKFL-COMP	Place & Compact Select Backfill	CY
SP-LIP	Steel Sheet Piling Left-In-Place	SF
SEED 1,2,3	Rake, Mulch & Seed(*)	SF
MSEED 1,2,3	Rake, Mulch & Seed(*)	SF
SOD 1,2,3	Grade & Sod(*)	SF
MSOD 1,2,3	Grade & Sod(*)	SF
SODX	Remove And Replace Existing Sod	SF
MSODX	Remove And Replace Existing Sod	SF
DIG-UG	Hand Dig	CF
EXC-1	Excavate 2'x 4'x 5'dp	EA
EXC-2	Excavate 4'x 6'x 5'dp	EA
EXC-3	Excavate 6'x 6'x 5'dp	EA

(*) NOTE: 1 = 100 S.F. or less, 2= 101-500 S.F., 3 = 501-1000 S.F.

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