Water Pipe Bursting-
A New Way to Replace Aging Water Infrastructure

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Project Manager

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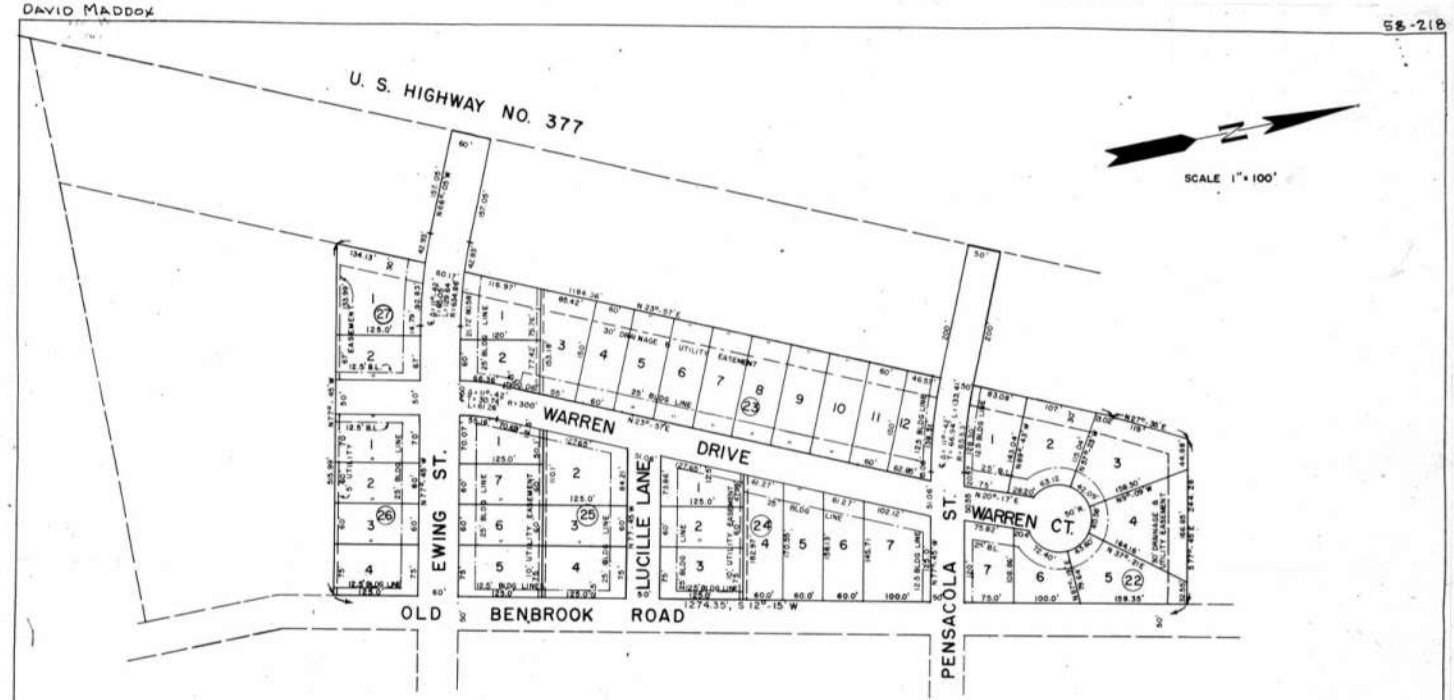
58-218



PLAT SHOWING

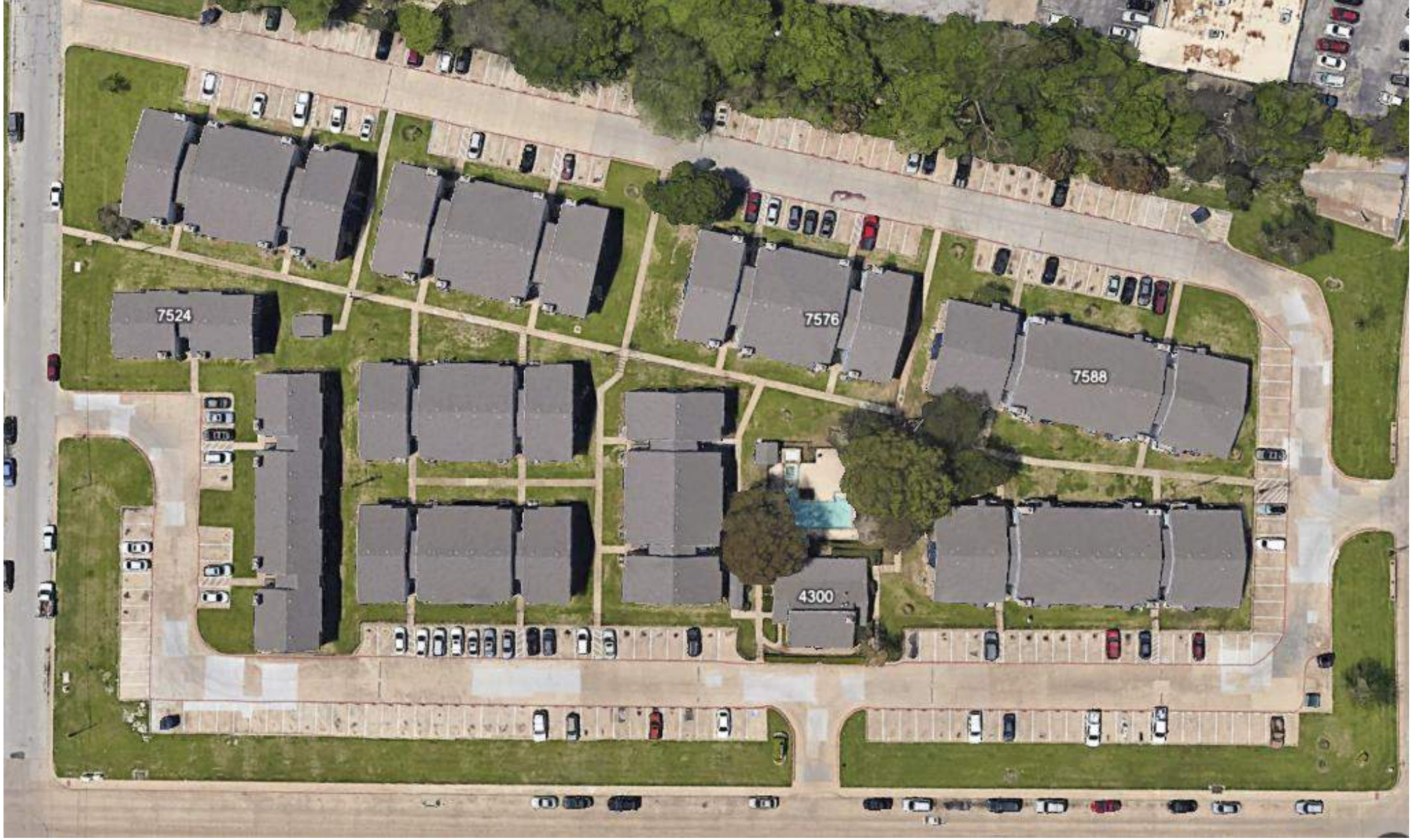
LOTS 1 THRU 7, BLOCK 22, LOTS 1 THRU 12, BLOCK 23, LOTS 1 THRU 7, BLOCK 24,
LOTS 1 THRU 7, BLOCK 25, LOTS 1 THRU 4, BLOCK 26,
LOTS 1 & 2, BLOCK 27.

RIDGECREST ADDITION

A SUBDIVISION OF PORTIONS
OF THE McKINNEY and WILLIAMS, I. SHRUMM, and J.W. SMITH SURVEYS IN THE
CITY OF FORT WORTH, TARRANT COUNTY,
TEXAS
SURVEYED SEPTEMBER, 1958
By
HUMPHREY & HILL, INC.
CONSULTING ENGINEERS & SURVEYORS

CITY OF FORT WORTH, TEXAS
CITY PLAN COMMISSION
NOTE:
THIS PLAT IS VALID ONLY IF RECORDED WITHIN SIX (6) MONTHS AFTER DATE OF APPROVAL.
PLAT APPROVED: DATE Nov 21, 1958
BY: _____
BY: W.J. Bryan Baker


WARREN DR
3
28
64


7524
7576
7588
4300

Water & Sanitary Sewer Rehabilitation for West Wind Apartments

- 60-year-old 6” water line & 6” sanitary sewer line
- Abandoned ROW
- Total: 800 LF of water & sanitary sewer line

4300 Old Benbrook Rd, Fort Worth, Texas

Water & Sanitary Sewer Rehabilitation for West Wind Apartments

- Challenges:
- Infrastructure as close as 10’ apart
- Buildings, pedestrian traffic, trees & franchise utilities

4300 Old Benbrook Rd, Fort Worth, Texas

Water & Sanitary Sewer Rehabilitation for West Wind Apartments

- Shield hired to investigate trenchless replacement
- Due to constraints, needed an innovative approach

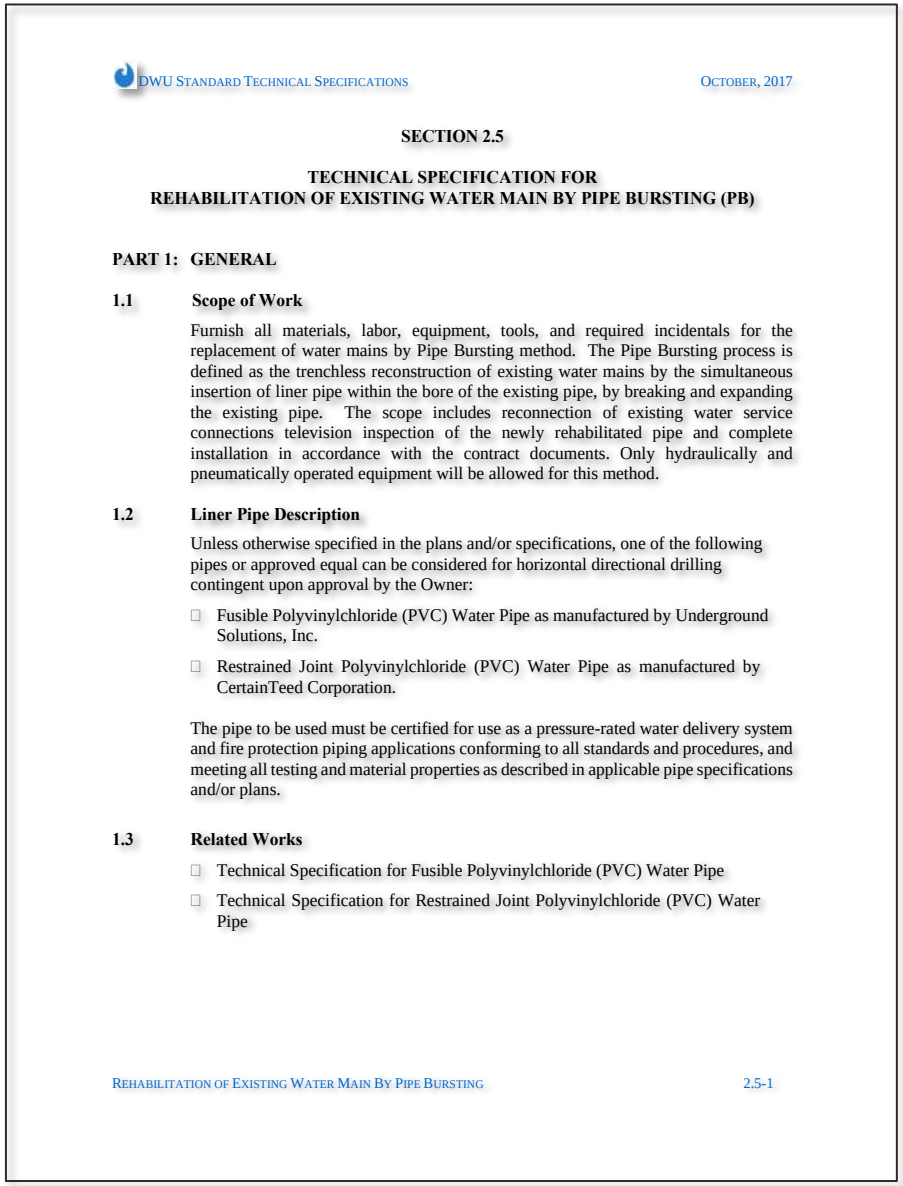
4300 Old Benbrook Rd, Fort Worth, Texas

Trenchless Methods

- Relocation by bore
- Horizontal Direcetional Drilling (HDD)
- Cured-in-Place Pipeline (CIPP)
- Sliplining
- Pipe Bursting

Research

- Meetings and coordination with experienced contractors
- Meetings with local municipalities
- Coordinate with material vendors/manufacturers
- Research local, state & federal specifications



SECTION 2.5

TECHNICAL SPECIFICATION FOR
REHABILITATION OF EXISTING WATER MAIN BY PIPE BURSTING (PB)

PART 1: GENERAL

1.1 Scope of Work

Furnish all materials, labor, equipment, tools, and required incidentals for the replacement of water mains by Pipe Bursting method. The Pipe Bursting process is defined as the trenchless reconstruction of existing water mains by the simultaneous insertion of liner pipe within the bore of the existing pipe, by breaking and expanding the existing pipe. The scope includes reconnection of existing water service connections television inspection of the newly rehabilitated pipe and complete installation in accordance with the contract documents. Only hydraulically and pneumatically operated equipment will be allowed for this method.

1.2 Liner Pipe Description

Unless otherwise specified in the plans and/or specifications, one of the following pipes or approved equal can be considered for horizontal directional drilling contingent upon approval by the Owner:

- Fusible Polyvinylchloride (PVC) Water Pipe as manufactured by Underground Solutions, Inc.
- Restrained Joint Polyvinylchloride (PVC) Water Pipe as manufactured by CertainTeed Corporation.

The pipe to be used must be certified for use as a pressure-rated water delivery system and fire protection piping applications conforming to all standards and procedures, and meeting all testing and material properties as described in applicable pipe specifications and/or plans.

1.3 Related Works

- Technical Specification for Fusible Polyvinylchloride (PVC) Water Pipe
- Technical Specification for Restrained Joint Polyvinylchloride (PVC) Water Pipe

HDPE and PVC Pipes: Pros and Cons

HDPE Cons:

- Flexible, durable, and long lasting
- Easier to handle and install
- Environmentally friendly

HDPE Cons:

- Typically more expensive than PVC

PVC Pros:

- Cheaper than HDPE
- Widely available

PVC Cons:

- More prone to cracking under stress
- Vulnerable to high temperatures

Research – Pipe Materials

Fracturable Pipes:

- Cast Iron (CI)
- Clay (VCP)
- Concrete (CP)
- Asbestos Cement (AC)
- High-density Polyethylene (HDPE)
- Polyvinyl Chloride (PVC)

Research – Pipe Materials

Non-fracturable Pipes:

- Ductile Iron (DI)
- Steel
- Galvanized Iron

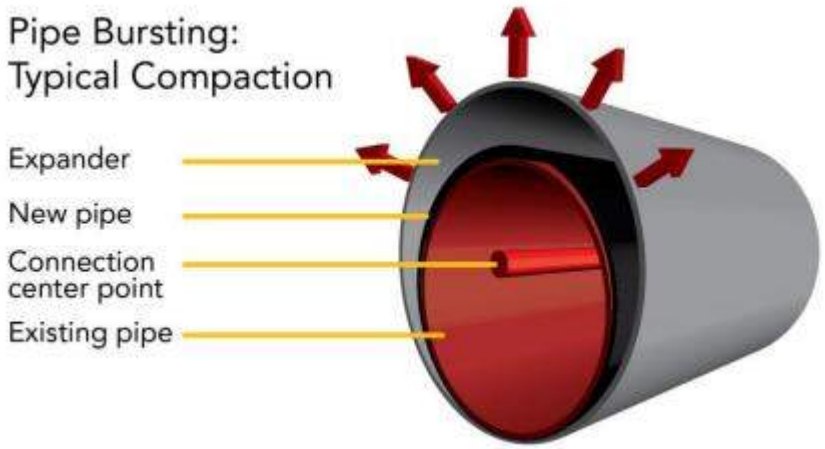
Pipe Bursting Considerations

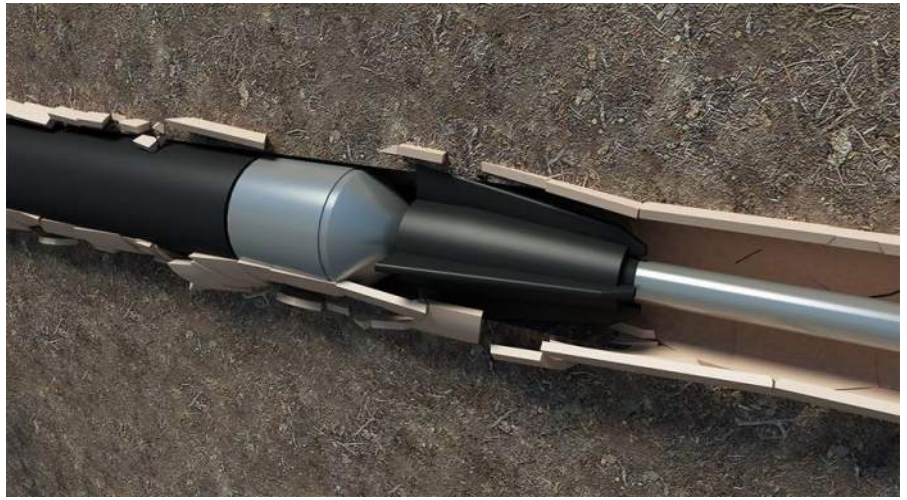
- Constructability concerns
- Point repairs at all fittings
- Temporary water services & reconnections

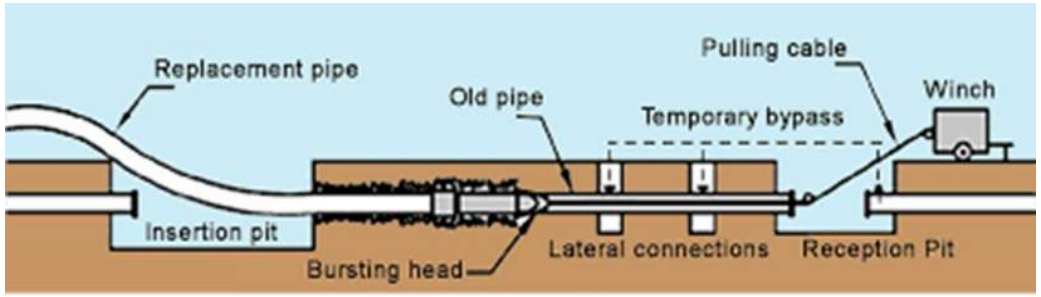
Pipe Bursting Considerations

- No replacement of multiple & changing pipe materials
- Help reduce timeframe
- Cost-saving potential

Pipe Bursting

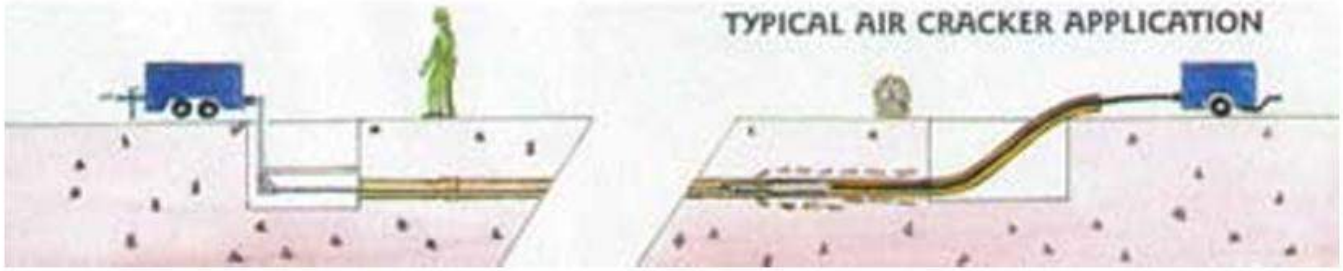






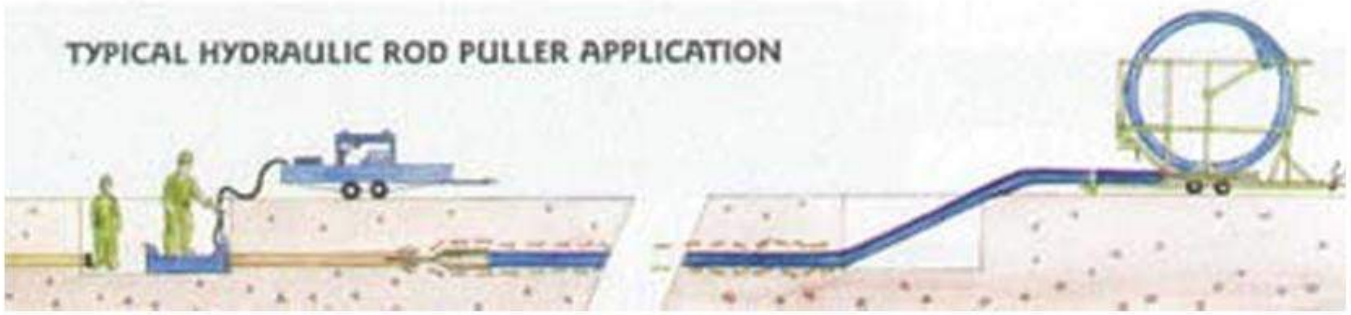
THE BASICS OF PIPE BURSTING

Pipe Bursting



Courtesy of U Mole Ltd.

Figure 1. Pneumatic Pipe Bursting



Courtesy of U Mole Ltd.

Figure 2. Hydraulic Pipe Bursting

Design Considerations

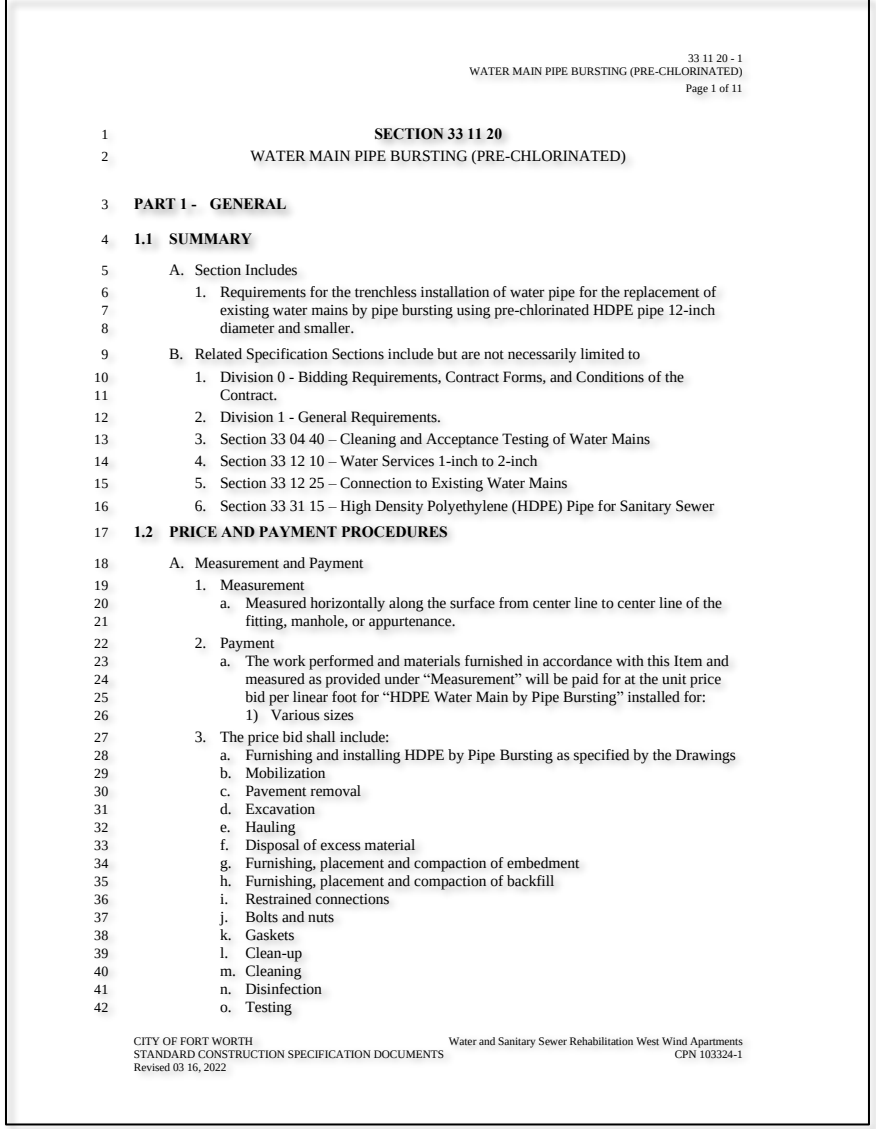
- Innovative approach
- Reduce incidental costs
- Pipe bursting a viable option

Design Considerations

- Longer than 750 LF run
- Limitations on cast iron fittings & sharp deflections/bends

Development of Specifications

- Researched pipe bursting for wastewater systems
- Compared them with water pipe bursting specs
- Combined specs for COFW
- Formatted new specs to COFW



SECTION 33 11 20

WATER MAIN PIPE BURSTING (PRE-CHLORINATED)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Requirements for the trenchless installation of water pipe for the replacement of existing water mains by pipe bursting using pre-chlorinated HDPE pipe 12-inch diameter and smaller.

B. Related Specification Sections include but are not necessarily limited to

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 33 04 40 – Cleaning and Acceptance Testing of Water Mains
4. Section 33 12 10 – Water Services 1-inch to 2-inch
5. Section 33 12 25 – Connection to Existing Water Mains
6. Section 33 31 15 – High Density Polyethylene (HDPE) Pipe for Sanitary Sewer

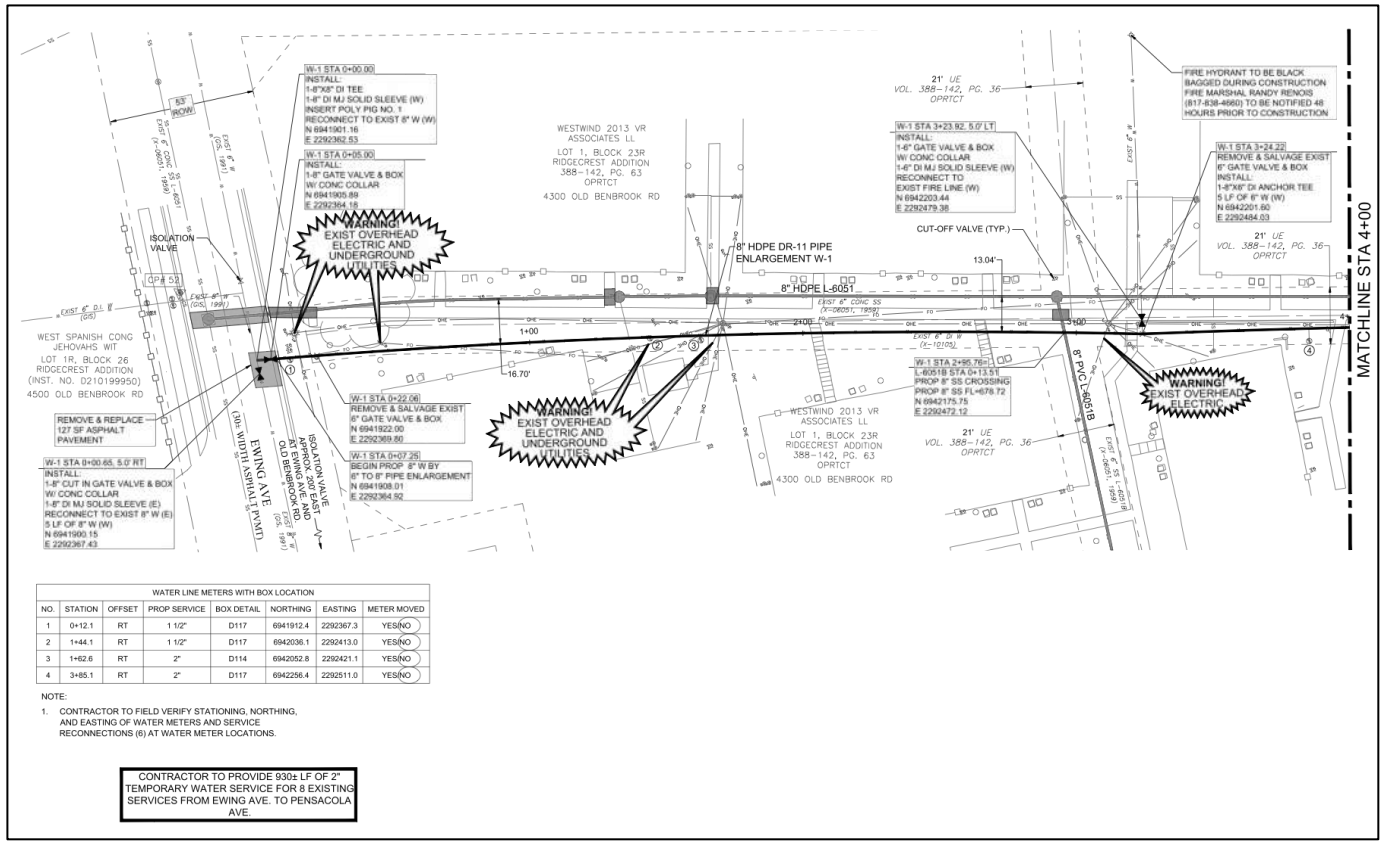
1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Measurement
   a. Measured horizontally along the surface from center line to center line of the fitting, manhole, or appurtenance.
2. Payment
   a. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "HDPE Water Main by Pipe Bursting" installed for:
      1) Various sizes
3. The price bid shall include:
   a. Furnishing and installing HDPE by Pipe Bursting as specified by the Drawings
   b. Mobilization
   c. Pavement removal
   d. Excavation
   e. Hauling
   f. Disposal of excess material
   g. Furnishing, placement and compaction of embedment
   h. Furnishing, placement and compaction of backfill
   i. Restrained connections
   j. Bolts and nuts
   k. Gaskets
   l. Clean-up
   m. Cleaning
   n. Disinfection
   o. Testing

Design Implementation

- Construction plans
- Contract manual & specifications
- Coordination with COFW & contractors
- Coordination with property management & residents



WATER LINE METERS WITH BOX LOCATION							
NO.	STATION	OFFSET	PROP SERVICE	BOX DETAIL	NORTHING	EASTING	METER MOVED
1	0+12.1	RT	1 1/2"	D117	6941912.4	2292367.3	YES(NO)
2	1+44.1	RT	1 1/2"	D117	6942036.1	2292413.0	YES(NO)
3	1+62.6	RT	2"	D114	6942052.8	2292421.1	YES(NO)
4	3+85.1	RT	2"	D117	6942256.4	2292511.0	YES(NO)

NOTE:
1. CONTRACTOR TO FIELD VERIFY STATIONING, NORTHING, AND EASTING OF WATER METERS AND SERVICE RECONNECTIONS (6) AT WATER METER LOCATIONS.

CONTRACTOR TO PROVIDE 930± LF OF 2" TEMPORARY WATER SERVICE FOR 8 EXISTING SERVICES FROM EWING AVE. TO PENSACOLA AVE.

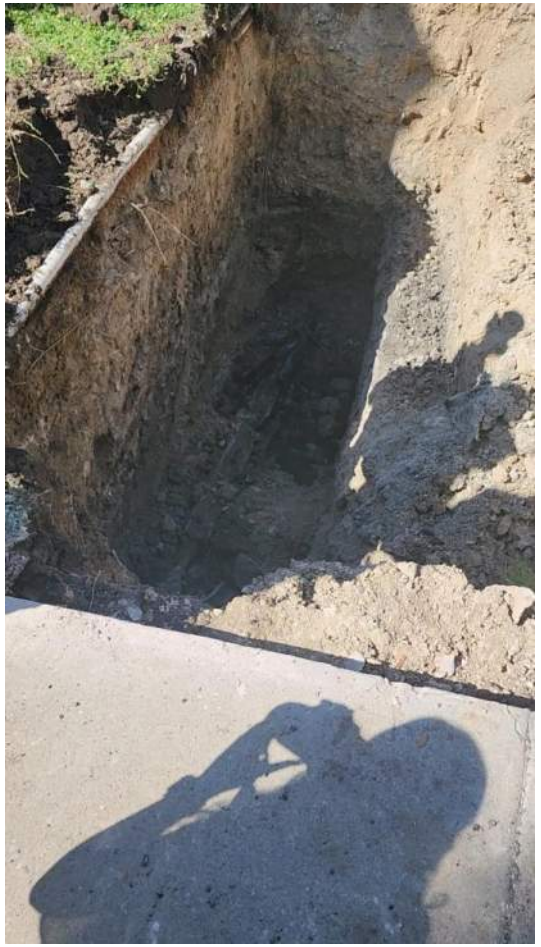
Construction Photos & Videos

Construction

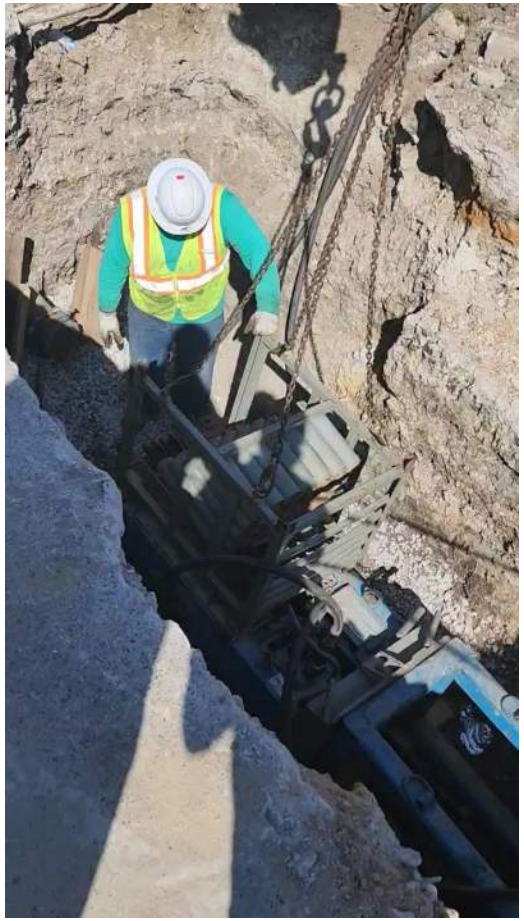
Construction

Construction

Construction



Construction



Questions

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ENGINEERING