



# City of Sacramento City Council

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915 I Street, Sacramento, CA, 95814  
[www.CityofSacramento.org](http://www.CityofSacramento.org)

**Meeting Date:** 3/27/2012

**Report Type:** Consent

**Title:** Contract Award: Reconstruction of Miscellaneous Sewer Manholes 2012 (X14110400)

**Report ID:** 2012-00266

**Location:** Citywide

**Recommendation:** Pass a Motion approving the contract plans and specifications for the Reconstruction of Miscellaneous Sewer Manholes 2012 project, and awarding the contract to Navajo Pipelines Inc., for an amount not-to-exceed \$103,150.

**Contact:** Bill Busath, Interim Engineering, (916) 808-1434; Brett Grant, Supervising Engineer, (916) 808-1413 - Department of Utilities

**Presenter:** None

**Department:** Department Of Utilities

**Division:** Cip Engineering

**Dept ID:** 14001321

## **Attachments:**

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- 1-Description/Analysis
- 2-Background
- 3-Exhibit A – Agreement with Navajo Pipelines, Inc.

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### **City Attorney Review**

Approved as to Form  
Joe Robinson  
3/15/2012 4:51:30 PM

### **City Treasurer Review**

Reviewed for Impact on Cash and Debt  
Russell Fehr  
3/12/2012 2:00:40 PM

### **Approvals/Acknowledgements**

Department Director or Designee: Dave Brent - 3/15/2012 3:49:36 PM

## Description/Analysis

**Issue:** This project will rehabilitate or replace 26 existing sewer manholes with structural deficiencies or substandard conditions.

**Policy Considerations:** This report's recommendation is consistent with the City's Strategic Plan Goals of improving and expanding public safety and achieving sustainability and livability. The requested action is in conformance with City Code Chapter 3.60, Articles I and III, which provide that the City Council may award competitively bid contracts to the lowest responsible bidder.

**Environmental Considerations:** The Community Development Department, Environmental Planning Services Division, has reviewed the proposed project and has determined that it is categorically exempt from the California Environmental Quality Act (CEQA), under State Class 2 and Section number 15302 (c) of the CEQA Guidelines (replacement or reconstruction of existing utility facilities).

**Sustainability:** The project is consistent with the City's Sustainability Master Plan by improving reliability, which will reduce energy-intensive maintenance efforts.

**Commission/Committee Action:** Not applicable

**Rationale for Recommendation:** The project was advertised to solicit bids and bids from six contractors were opened on February 22, 2012. Navajo Pipelines, Inc. was the lowest responsible bidder.

**Financial Considerations:** The construction contract is for an amount not to exceed \$103,150, and the total project cost is estimated to be \$170,000. There are sufficient funds to award the construction contract and complete the project.

**Emerging Small Business Development (ESBD):** This project included a participation goal of 20% for emerging and small business enterprises (ESBEs). The lowest responsible bidder, Navajo Pipelines, Inc., exceeded the ESBE participation goal with a participation level of 70.43%.

## BACKGROUND

On an ongoing basis, the City has a need to replace or rehabilitate existing sanitary sewer manholes with structural deficiencies or in substandard condition. Reconstructing or rehabilitating a manhole maintains its structural integrity and stops corrosion caused by sulfuric acid attack. Included in the rehabilitation process is the installation of adequate flowlines and sloped benches. Safety is also addressed by removing deteriorated rungs and adjusting head and covers to proper grade.

There are twenty-six manholes that will be replaced or rehabilitated as part of this project. These manholes are located throughout the City's sanitary sewer system.

Each manhole was identified by Field Services as in need of rehabilitation and a sewer repair order was generated. Engineering Services inspected the manholes and identified the scope of work needed for each manhole.

Bids were requested and six bids were received and opened on February 22, 2012. A summary of the bids are as follows:

| <b>Contractor</b>          | <b>Bid Amount</b> |
|----------------------------|-------------------|
| Navajo Pipelines, Inc.     | \$103,150         |
| Arrow Construction         | \$111,880         |
| C.E. Cox Engineering       | \$119,350         |
| Florez Paving              | \$125,350         |
| Coastline Water Resources  | \$129,225         |
| Martin General Engineering | \$161,170         |

The Engineer's estimate was \$130,000.



SPECIAL PROVISIONS  
FOR  
**RECONSTRUCTION OF MISCELLANEOUS SEWER MANHOLES-2012**  
(PN: X14110400)

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## **SECTION 1 – GENERAL CONSTRUCTION REQUIREMENTS**

### **1.01 Location, Scope of Work**

These Special Provisions cover, in general, the reconstruction and rehabilitation of existing sewer manholes in various locations throughout the City of Sacramento. The locations of manholes are shown on the maps located in Appendix A of these Special Provisions. The Contractor shall provide all labor, materials, tools and equipment, and shall perform all work necessary to complete the subject project in place and as specified herein.

### **1.02 Specifications**

The work to be performed under this contract shall be done in accordance with the Special Provisions contained herein. In these Special Provisions, reference is made to the Standard Specifications of the City of Sacramento, adopted June 2007, referred to herein as "Standard Specifications". The general requirements of this contract shall be governed by these Special Provisions first, followed by Sections 1 through 8 of the Standard Specifications. Other standards or specifications specified in these Special Provisions govern only the applicable technical specifications.

### **1.03 Pre-bid Interpretation of Contract Documents**

Requests for interpretation of contract documents shall be made in writing and delivered to the City at least seven (7) calendar days before the time announced for opening the proposals. Interpretation, where necessary, will be made by the City in the form of an addendum to the contract documents and, when issued, will be sent as promptly as is practicable to all parties to whom the bid documents have been issued. All such addenda shall become part of the contract. Requests for information regarding this procedure or other similar information shall be directed to Sonia Lopez of the Engineering Division, Department of Utilities, 1395 35<sup>th</sup> Avenue, Sacramento, CA 95822 (916) 808-1456.

It shall be the bidder's responsibility to call to the attention of the Engineer any missing pages or drawings in the contract documents including the addenda. These items shall be brought to the attention of the Engineer at least 7 calendar days prior to the bid opening date.

### **1.04 Proof of Compliance with Contract**

In order that the Engineer may determine whether the Contractor has complied with the requirements of the contract documents not readily determinable through inspection and tests of plant, equipment, work, or materials, the Contractor shall at any time when requested, at the Contractor's expense, submit to the Engineer properly authenticated documents or other satisfactory proofs as to his compliance with such requirements.

### **1.05 Review of Contractor Information**

In accordance with Section 5-7 of the Standard Specifications, Contractor shall prepare

and submit for review 5 copies of the following shop drawings and submittals:

1. Construction schedule
2. Record drawings (upon completion of work)
3. Concrete mix design (manholes and paving)
4. Traffic control plan
5. Water quality control plan
6. Proposed pipe material and fittings
7. Manhole rehabilitation material
8. Temporary diversion of flows (if necessary)
9. Dewatering plan (if necessary)
10. Public notification plan
11. Shop drawings for all pre-cast, manufactured or pre-fabricated items

Contractor is advised that at the Engineer's discretion, the above list may be expanded to include additional items to which Section 5-7 of the Standard Specifications will apply.

#### **1.06 Project Scheduling**

The Contractor shall submit a detailed schedule showing all items of work prior to initiating construction. The schedule shall include the proposed sequencing of construction activities. The schedule shall be submitted, reviewed and updated in accordance with Section 7-2 of the Standard Specifications. No progress payments will be made for work completed prior to acceptance of the schedule. Weekend work will be done in accordance with Section 7-4 of the Standard Specifications.

#### **1.07 Record Drawings**

The Contractor shall maintain a neat and accurate marked set of record drawings showing the final locations and layout of piping and conduit; structures; and other facilities. Drawings shall be kept current weekly, with all work instructions and change orders, and construction adjustments. Drawings shall be subject to the inspection of the Engineer at all times and progress payments, or portions thereof, may be withheld if drawings are not accurate and current. Pipe material shall be added to drawing, if not denoted on contract drawings. Prior to acceptance of the work, the Contractor shall deliver to the Engineer one (1) set of neatly marked record drawings accurately showing the information required above.

Record drawings shall be submitted and approved by the Engineer in accordance with "Review of Contractors Information" of these Special Provisions.

#### **1.08 Materials and Equipment**

The Contractor is responsible for the care and protection of all materials and equipment until the completion and final acceptance of the work, in accordance with Section 5-15 through 5-18, 5-21, and 5-22 of the Standard Specifications and these Special Provisions.

### **1.09 Administrative Penalty Ordinance**

The Contractor shall become familiar with Chapter 12.20 of the City Code which contains minimum requirements and restrictions relating to construction activities within the City right of way and establishes administrative penalties for non-compliance of these requirements. The Contractor may be assessed the administrative penalty for each violation of any provision addressed by the ordinance, unless modified herein, and amounts can be deducted from the Contract. In general, the ordinance includes the following categories:

- Working hours for the City's "Primary Streets"
- Traffic control plan requirements
- Access to private property
- Maintenance of construction areas
- Maintenance of traffic, public safety and convenience
- Repair of traffic control systems
- Care of existing known facilities
- Protection of existing improvements
- Public notification
- Noise levels

Copies of the ordinance are available from the City Clerk's Office, 915 I Street, Sacramento, CA. 95814, and at [www.cityofsacramento.org](http://www.cityofsacramento.org).

### **1.10 Water Quality Control**

The Contractor shall be responsible for the requirements consisting of regulations contained in the National Pollution Discharge Elimination System (NPDES) Stormwater Permit, issued to the City and in accordance with Section 16 of the Standard Specifications.

The City reserves the right to take corrective action and withhold the City's costs for corrective action from progress payments or final payment in accordance with Section 7, "Retention of Sums Charged against the Contractor", of the Agreement, contained herein. Any fines, including third-party claims, levied against the City as a result of the Contractor's non-compliance are the Contractor's sole responsibility and will be withheld from progress payments or final payment in accordance with Section 7, of the Agreement.

### **1.11 Pavement Cutting and Surface Restoration**

Pavement cutting and surface restoration shall conform to the applicable provisions of Section 26-11 of the Standard Specifications and these Special Provisions. The Contractor shall restore surfaces in kind (using the same surface material as existing) unless otherwise noted on the Drawings or within these Special Provisions. Payment for restoring the surface in kind within any excavation shall be included in the associated item of work unless otherwise stated in these Special Provisions.

If trench crosses sidewalk, curb, and gutter, Contractor shall replace entire sidewalk panel to nearest control or expansion joint on both sides of trench wall. Extent of curb and gutter replacement shall coincide with sidewalk panel being replaced.

### **1.12 Project Closeout**

When the project is completed in accordance with the Plans and Specifications, the Contractor shall notify the Engineer of the completion of the project at which time the City will prepare a list of deficient work items, or punch list, and after all punch list items have been completed to the satisfaction of the Engineer, and as-built drawings are completed and submitted, a completion report will be prepared, as detailed and in accordance with Section 8-4 of the Standard Specifications.

### **1.13 Payment**

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in performing and complying with these General Requirements shall be considered as included in the prices paid for in the various contract bid items the Contractor deems appropriate and no additional compensation will be allowed.

## **SECTION 2 – PUBLIC CONVENIENCE & PROTECTION OF EXISTING CONDITIONS**

### **2.01 Public Right-of-Way and Easements**

All water, sewer & drainage pipe and appurtenances constructed as part of this project are to be placed within public street rights-of-way and easements. The Contractor shall confine his or her operations within the limits of existing street right-of-way or easements as much as practicable.

In the event the Contract requirements necessitate the Contractor to encroach onto adjoining private property the Contractor shall make all necessary arrangements with the owner of the property for such encroachment. A copy of any written agreements entered into between the Contractor and the property owner concerning encroachment onto private property shall be provided to the Engineer prior to beginning any work on the property described in the agreement.

### **2.02 Existing Facilities**

Protection and maintenance of existing utilities shall meet the applicable requirements of Section 13 of the Standard Specifications and these Special Provisions.

The location, alignment, and depth of existing underground utilities as shown on the Drawings are taken from public records and no responsibility is assumed for the accuracy thereof. For the most part, underground utility services are not shown on the Drawings.

The Contractor is expected to "pothole" existing underground utilities a minimum of ten (10) working days in advance at any location where an existing utility may be in conflict with the proposed work.

The cost of relocating existing overhead and/or underground utilities not specified on the Drawings to be relocated, but are relocated or cut and reconnected at the Contractor's choice, shall be borne by the Contractor.

### **2.03 Existing Site Conditions**

Bidders are directed to Section 2-4 of the Standard Specifications which requires Bidders to examine the project site.

### **2.04 Handling and Removal of Hazardous or Contaminated Materials**

In the event hazardous or contaminated materials are encountered at the site for which separate handling or removal provisions have not been made in these Special Provisions, the Contractor shall stop work on that item, contact the Engineer and schedule his operations to work elsewhere on the site, if possible. The City will be responsible for handling and removal of hazardous material or may request that the Contractor be made available, through contract change order, to provide additional services as needed for the completion of the work. Additional services may consist of retaining a subcontractor who

possesses a California license for hazardous substance removal and remedial actions.

Hazardous or contaminated materials may only be removed and disposed of from the project site in accordance with the following provisions:

1. All work is to be completed in accordance with the following regulations and requirements:
  - i. Chapter 6.5, Division 20, California Health and Safety Code.
  - ii. California Administration Code, Title 22, relating to Handling, Storage, and Treatment of Hazardous Materials.
  - iii. City of Sacramento Building Code and the Uniform Building Code , 1994 edition.
2. Coordination shall be made with the County of Sacramento Environmental Management Department, Hazardous Materials Division, and the necessary applications shall be filed.
3. All hazardous materials shall be disposed of at an approved disposal site and shall only be hauled by a current California registered hazardous waste hauler using correct manifesting procedures and vehicles displaying a current Certificate of Compliance. The Contractor shall identify by name and address the site where toxic substances shall be disposed of. No payment for removal and disposal services shall be made without a valid certificate from the approved disposal site that the material was delivered.

None of the aforementioned provisions shall be construed to relieve the Contractor from the Contractor's responsibility for the health and safety of all persons (including employees) and from the protection of property during the performance of the work. This requirement shall be applied continuously and not be limited to normal working hours.

## **2.05 Health and Safety**

The Contractor is warned that existing sewers and appurtenances have been exposed to sewage and industrial wastes. These facilities shall therefore be considered contaminated with disease-causing organisms. Personnel in contact with contaminated facilities, debris, wastewater, or similar items shall be advised by the Contractor of the necessary precautions that must be taken to avoid becoming diseased. It is the Contractor's responsibility to urge his personnel to observe a strict regime of proper hygienic precautions, including any inoculations recommended by the local public health officer.

Because of the danger of solvents, gasoline, and other hazardous material in the existing sewers, these areas shall be considered hazardous to open flame, sparks, or unventilated occupancy. The Contractor shall be aware of these dangers and shall take the necessary measures to assure his personnel observe proper safety precautions when working in these areas.

The Contractor shall not allow any wastewater to discharge from sewage collection systems onto adjacent lands or waters. In case of accidental discharge, the Contractor shall be responsible for containment, immediate cleanup and disposal at his own expense

to the full satisfaction of the Engineer. Where containment is not possible, adequate disinfection shall be provided by the Contractor at his expense as directed by the Engineer or agency with jurisdiction. If, in the opinion of the Engineer, the Contractor fails to adequately follow the above guidelines, he will make arrangements to have the work done by others, and have the cost charged to the Contractor.

## **2.06 Public Notification of Work**

The Contractor shall notify property owners and/or tenants adjacent to the project limits in writing two (2) working days in advance of beginning work; a minimum of three (3) working days if work is on private property. The notice shall be approved by the Engineer and shall describe the work to be performed, the anticipated duration of construction and the name and telephone number of the Contractor's representative that can be reached 24 hours a day, seven (7) days a week.

## **2.07 Maintenance of Traffic, Public Safety and Convenience**

The Contractor's attention is directed to Sections 6-6 through 6-11 and 7-4 of the Standard Specifications.

Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at his expense. Water or dust palliative shall be applied if ordered by the Engineer for the alleviation or prevention of dust nuisance.

All persons performing work shall repair or replace to previous condition or better, all existing traffic control system markers or devices that are damaged or destroyed during work within three (3) calendar days of the completion of work in the immediate area unless written direction extending the time period or relieving the persons performing work of this obligation is provided by the Engineer.

The Contractor will ensure that utility services to customers in the project are maintained.

Contractor shall not interfere with or impair any railroad operations in accordance with Section 6-6 of the Standard Specifications.

The Contractor shall be required to establish traffic scheduling and control measures acceptable to the Engineer prior to starting any work. The Contractor shall submit to the Engineer for review and approval a plan showing proposed traffic control measures and/or detours for vehicles and pedestrians affected by the construction work. This plan shall be submitted a minimum of ten (10) working days prior to the scheduled commencement of any work by the Contractor. **The Contractor will not be allowed to begin work until an approved plan is on file with the Engineer.** In addition, the approved plan shall be kept on hand at the project site at all times while construction is in progress. All advance warning and traffic delineation shall conform to the provisions of Section 6-10 of the Standard Specifications.

The Contractor's traffic control plan shall include location of proposed work area, locations of areas where the public right of way will be closed or obstructed, any proposed phases of

traffic control and time period of when traffic control will be in effect. The traffic control plan shall also include name and business address of Contractor and a statement that the Contractor will comply with City's noise ordinance.

The Contractor shall be solely and completely responsible for furnishing, installing, and maintaining all warning signs and devices necessary to safeguard the general public and the work, and to provide for the safe and proper routing of all vehicular and pedestrian traffic during the performance of the work. The requirement shall apply continuously and shall not be limited to normal working hours.

The Contractor shall perform the following requirements included in the City ordinance Chapter 12.20, with this contract:

1. The Contractor shall not cause public rights-of-way, public property or public easement to be covered with construction related trash, debris, garbage, waste material or soil. Areas affected by the construction, must be cleaned to the satisfaction of the Engineer prior to re-opening to the public.
2. Trench plates shall not be utilized for more than three (3) calendar days in one location and temporary surfacing shall not be utilized for more than five (5) calendar days in one location without prior written approval of the Engineer.
3. The Contractor shall provide access to all existing driveways at all times unless other arrangements are made with the property owner. Access for emergency vehicles shall be available on all streets within the construction area at all times.
4. Rear access to buildings and existing parking areas behind buildings shall be maintained. If arrangements have been made with property owners, the Contractor may close such access for a limited time. Contractor shall give property owners forty-eight (48) hours notice in advance of the closure.
5. Provide for pedestrian traffic at all times except where closures are approved in advance by the Engineer.
6. At least one (1) lane of traffic shall be maintained at all times in the street. All work within public streets and/or roadway right-of-way shall be done in an expeditious manner so as to cause as little inconvenience to the traveling public as possible. Skid - resistant steel plates or other approved methods shall be used to cover all open excavations in the roadway during non-working hours for the entire project.
7. For work done before 7:00 A.M. or after 6:00 P.M., or during all daylight hours between 6:00 P.M. Friday to 7:00 A.M. Monday, the street or alley may be closed provided proper detours are provided and only if arrangements have been made with the property owners in advance and approved by the Engineer. A minimum of five (5) working days notice shall be given to property owners in advance of closure.

8. At night and at other times when work is not in progress, the entire roadway and alley shall be open to the public for traffic.

The Contractor is hereby alerted that some streets are designated as a "primary street" and as such the requirements and administrative penalties of Chapter 12.20 of the City ordinance apply. In accordance with the ordinance, the Contractor shall not impede traffic in any fashion outside the work hours of 8:30 A.M. and 4:00 P.M. A list of primary streets is located in Appendix B, of these Special Provisions.

All signs and street marking damage caused by or related to the construction of this project shall be replaced in kind by the Contractor. In the case of partial damage to lane stripes and traffic lettering the whole stripe or marking in its entirety shall be replaced. Temporary markings and striping shall be installed within three (3) working days of damage.

Prior to closing the street or alley, Contractor shall contact the following agencies:

1. Police Communication Center one (1) working day prior to closure by calling 277-1780, or fax at 277-1772.
2. Fire Department Communications Center one (1) working day prior to closure by calling 228-3035 or fax at 228-3075.
3. City Traffic Engineering Services five (5) working days prior to closure by calling 808-5307.
4. City Solid Waste Division five (5) working days prior to closure by calling 808-4952 or fax at 808-4999. The Contractor shall also coordinate with the property owners all relocations of trash receptacles necessary to maintain garbage collection.
5. Street Parking five (5) working days prior to closure by calling 808-5872 or fax at 808-7501.
6. Regional Transit five (5) working days prior to closure by calling Lynn Cain at 321-5375 or fax at 557-4541.

At a minimum, the information faxed shall include:

Project name and number;  
Contractor's name and a 24-hour phone number;  
City of Sacramento's project manager's name;  
Limits of street closure, with street names;  
Anticipated duration of street closure.

## **2.08 Removal of Street Parking**

In locations where the Contractor's operations require removal of on-street parking, such removal shall be in accordance with Section 6-18 of the Standard Specifications.

Failure to comply with this section will prevent the City from towing vehicles parked in the proposed work area.

## **2.09 Trench Excavation and Backfill**

Trench excavation and backfill in all streets shall meet the applicable requirements of Sections 10, 14 and 26 of the Standard Specifications and these Special Provisions. If specified in these Special Provisions, pipe shall be backfilled using Controlled Density Fill (CDF) or slurry cement backfill, in accordance with Section 10-16 of the Standard Specifications, and as directed by the Engineer.

When the Engineer approves shallow placement of drain inlet leads requiring protective measures, all work associated with protective measures shall be considered as extra and paid per Section 8 of the Standard Specifications.

## **2.10 Pavement Cutting and Surface Restoration**

Pavement cutting and surface restoration shall conform to the applicable provisions of Section 26-11 of the Standard Specifications and these Special Provisions. The Contractor shall restore surfaces in kind (using the same surface material as existing) unless otherwise noted on the Plans or within these Special Provisions. Payment for restoring the surface in kind within any excavation shall be included in the associated item of work unless otherwise stated in these Special Provisions.

If trench crosses sidewalk, curb, and gutter, Contractor shall replace entire sidewalk panel to nearest control or expansion joint on both sides of trench wall. Extent of curb and gutter replacement shall coincide with sidewalk panel being replaced. Pavement cutting shall be perpendicular and parallel to the centerline of the road when practicable.

## **2.11 Temporary Pavement**

Temporary paving shall be in accordance with Section 14-4 of the Standard Specifications.

## **2.12 Tree Preservation Requirements**

Trees within the project area shall be protected by the following means:

1. The Contractor shall hire an International Society of Arboriculture (ISA) certified arborist to do any required pruning for equipment clearance. The Contractor shall contact the City Arborist (Dan Pskowski, 768-8604) for a root inspection(s) for trenching activities within the dripline(s) of the trees.
2. If during excavation for the project, tree roots greater than two (2) inches in diameter are encountered, work shall stop immediately until the arborist can perform an on-site inspection. All roots shall be cut clean and the tree affected may require supplemental irrigation/fertilization and pruning as a result of the root cutting. The Contractor will be responsible for any costs incurred. Depending upon the amount of roots encountered and the time of year, wet burlap may be required along the sides of the trench.

3. The Contractor shall be held liable for any damage to existing trees, i.e. trunk wounds, broken limbs, pouring of any deleterious materials, or concrete washout under the dripline of the trees. Damages will be assessed using the A Guide to Plant Appraisal eighth edition, published by the International Society of Arboriculture. An appraisal report shall be submitted for review by the City arborist.
4. Tree protection methods noted above shall be identified on all construction Drawings for the project.

### **2.13 Payment**

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in performing and complying with these General Requirement items shall be considered as included in the prices paid for in the various contract bid items the Contractor deems appropriate and no additional compensation will be allowed.

**END OF SECTION**

## SECTION 3 – ITEMS OF THE PROPOSAL

### Item No. 1 Preconstruction Photographs

Prior to beginning any work on manholes, Contractor shall provide preconstruction photographs, or video, in accordance with Section 11 of the Standard Specifications.

Payment for preconstruction photographs shall be at the contract lump sum price bid and shall include full compensation for furnishing all labor, materials, tools and equipment, and for performing all work necessary to complete this item in place.

### Item No. 2 Manhole No. 3 to Replace

Existing manholes and catch basin manholes shall be removed and a Manhole No. 3 or No. 3A shall be constructed where shown on the Drawings, in accordance with Section 25 and 38 of the Standard Specifications, and as directed by the Engineer. Eccentric cones shall not be used unless specified on the Plans or by the Engineer. If eccentric cone is used, vertical face of cone shall be parallel to flow and away from traffic (closest to the nearest curb.)

The existing manhole shall be disposed of away from the site of the project. Excavation shall conform to Section 14-2 of the Standard Specifications. The existing frame and cover shall be cleaned of all foreign material and delivered to the City of Sacramento Corporation Yard, Division of Field Services, 5730 24th Street, Attention: Rob Jack, Sewer Superintendent (916) 808-4022.

Flowline material for main pipe and intersecting mains shall be vitrified clay except: if manhole base is precast concrete. Clay liner may be omitted for manholes with mains of 36 inch diameter and larger. Flow line material shall conform to Section 10 of the Standard Specifications and these Special Provisions. New flowline shall match inlet and outlet pipe elevations and shall extend to inside face of manhole. If inlet and outlet pipes are of different sizes, new flowline pipe size shall match larger pipe size.

Manhole bench shall slope upwards from the spring-line of the pipe to the projected level of the crown of the pipe at the manhole wall or twelve (12) inches above the spring-line, whichever is less. All holes, cracks, and seams shall be grouted flush using nonshrink grout with the manhole interior. Non-shrink grout shall be "Metallic Grouting Compound" by Burke, "Embeco" by Master Builders, "Ferrolith-G" by Sonneborn-Desoto, or approved equal. All internal surfaces shall have a smooth finish.

External Manhole Seal - External joint of each barrel section and of the barrel/cone connection shall be sealed with an external rubber sealing sleeve as manufactured by Infi-Shield Inc. or equal. The seal shall be made of neoprene and EPDM rubber and have a minimum thickness of 60 mils. Material shall conform to specifications of ASTM C923, ASTM C443, and ASTM F477. Rubber seal shall be attached to manhole using a non hardening butyl rubber mastic applied to the top and bottom of sleeve in accordance with

manufacturer's instructions. Seal shall overlap joint a minimum of three (3) inches and shall be continuous around the perimeter of the barrel section and overlapped six (6) inches minimum.

Manhole Testing: All sanitary sewer manholes shall be tested and shall meet the requirements of ASTM C1244 prior to acceptance. Manholes shall be tested prior to backfill. If the manhole fails the test at this time, the manhole shall be repaired by the Contractor and retested. This procedure shall be repeated until the manhole passes the required test. The Engineer may also require the manholes to be tested using this method after backfilling if he has reason to suspect that the manhole has been disturbed during the backfilling operation, or at other times during construction of the improvements being installed as part of the development.

In order to prepare the manhole for this test, all lift holes shall be plugged and all pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn in to the manhole.

The test procedure shall be as follows:

- The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
- A vacuum of ten (10) inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to nine (9) inches of mercury.
- The manhole shall pass if the time for the vacuum to drop from ten (10) inches of mercury meets or exceeds the values indicated in Table 1 of ASTM C1244.

The vacuum gauge used for this test shall be supplied by the Contractor, and shall have maximum scale division of 0.1 psi, and shall have an accuracy of 0.04 psi. Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six month intervals, or when requested by the Engineer. In addition, the Engineer may compare the Contractor's gauge with a City owned gauge at any time. During testing, the vacuum gauge shall be located such that it is readily visible.

Surface restoration shall be in accordance with the section of the General Requirements entitled "Pavement Cutting and Surface Restoration" and shall be paid for under this item of the contract. Pavement cutting shall be perpendicular and parallel to the centerline of the road.

Payment shall be at the unit price bid per each manhole constructed and shall include full compensation for furnishing all labor, materials, tools and equipment and for performing all work necessary to complete this item in place.

**Item No. 3 Manhole to Rehabilitate**

This item shall govern all work, labor, materials, equipment and incidentals necessary for sanitary sewer manhole interior rehabilitation for the purpose of eliminating infiltration and inflow, providing corrosion protection, repair of cracks and voids and verification and/or restoration of the structural integrity of the manhole.

The Contractor shall rehabilitate the manhole structures as indicated on the Drawings using a cementitious liner coated with an epoxy resin, or a calcium aluminate liner.

The Contractor shall submit a complete manhole rehabilitation submittal to the Engineer for review and approval. The submittal shall include, but shall not be limited to the following:

1. Name of the liner manufacturer and product data including the safety data sheets, certifications of materials, and the physical properties and chemical resistance testing of the liner system.
2. Name of the manufacturer and product data including the safety data sheet for the patching/plugging compound and the chemical sealant if infiltration exists.
3. Plan of construction including schedule, equipment setup, inspection, preparation, cleaning, and complete installation procedures and details.
4. Qualifications of the installer including certification by the manufacturer.

The rehabilitation liner shall conform to the following specifications:

Cementitious liner shall be applied to the manholes indicated on the Drawings. Cementitious liner used to repair and line manholes shall be Strong Seal MS-2C as manufacture by Strong-Seal Systems, ThoRoc SP15 Spray Mortar as manufactured by Chem Rex Inc., or approved equal.

As a minimum, cementitious liners shall meet the following physical properties:

|                    |                      |           |
|--------------------|----------------------|-----------|
| ASTM C109          | Compressive strength | 3,000 psi |
| ASTM C78           | Flexural strength    | 600 psi   |
| ASTM C596          | Shrinkage @ 90% R.H. | 0%        |
| ASTM C952          | Bond                 | 130 psi   |
| Density of mixture |                      | 100 pcf   |

Cementitious products shall be formulated with clean potable water and ASTM C-150 Type I or III Cement.

The Engineer will test random batches of the spray applied mortar. If mortar does not meet the minimum physical properties as listed above, then all manholes coated with that particular batch shall be rejected. The spray applied mortar shall be in strict conformance with the manufacturer's directions.

Surface preparation shall be performed to obtain a clean, dry, exposed aggregate condition of all concrete surfaces to be coated. All loose spalled concrete shall be removed. The exposed surface shall be sound, porous, and free of dust, dirt, grease, oil, fats, concrete sealing or hardening chemicals, form release agents or other contaminants. Surface preparation can be accomplished using sandblasting or pressure washing (3500 psi) techniques.

An approved cementitious plug or chemical grout can be used to stop active infiltration.

All patching, infiltration control, and grouting material shall be approved by the manufacturer prior to use in the manhole(s).

Prior to spraying, the surface shall be damp without noticeable free water droplets or running water.

The mixer/sprayer shall be approved by the manufacturer.

The minimum thickness for cementitious liners shall be ½ inch.

Contractor shall allow the cementitious liner to cure for a minimum of 24 hours before applying an epoxy liner. Contractor shall confirm that the epoxy product is compatible with cementitious coating.

Cementitious liner shall be sanded or water blasted before applying epoxy coating.

Epoxy liner used to coat cementitious liner in manholes shall be Raven 405 as manufactured by Raven Lining Systems, Inc.; Sewer Guard HBS100 Epoxy Liner as manufactured by ChemRex, Inc.; or approved equal.

As a minimum, epoxy resins shall meet the following physical characteristics:

|                                |                 |
|--------------------------------|-----------------|
| ASTM D695 Compressive strength | 10,800 psi      |
| ASTM D790 Flexural strength    | 11,300 psi      |
| Solids (by volume)             | 100%            |
| ASTM D2240 Hardness Shore      | D 83            |
| Density of mixture             | 70 lbs./cu. ft. |

Epoxy resin liners shall be installed by factory trained and approved application technicians. Application technicians shall have a minimum of one (1) year field experience with the application of high build epoxy coatings.

Calcium aluminate lining material shall be applied to the manholes indicated in the Drawings and shall be either SewperCoat PG or SewperCoat 2000HS Regular as manufactured by Kerneos, Inc., or approved equal.

The chemical composition of the cement portion and the aggregates of the calcium aluminate liner shall be as follows:

|                                |        |                                      |                  |
|--------------------------------|--------|--------------------------------------|------------------|
| Al <sub>2</sub> O <sub>3</sub> | CaO    | FeO + Fe <sub>2</sub> O <sub>3</sub> | SiO <sub>2</sub> |
| 41-46%                         | 33-38% | 8-13%                                | 4-9%             |

As a minimum, calcium aluminate liner shall meet the following physical properties:

|  |                                       |          |
|--|---------------------------------------|----------|
| Compressive Strength (ASTM C109)       | > 8,000 psi                           | 28 days  |
| Flexural Strength (ASTM C293)          | > 1,200 psi                           | 28 days  |
| Splitting Tensile Strength (ASTM C496) | > 800 psi                             | 24 hours |
| Bond Strength/Slant Shear (ASTM C882)  | > 1,200 psi                           | 24 hours |
| Shrinkage at 28 days (ASTM C596)       | < 0.08% cured @ 90% relative humidity |          |
| Freeze/Thaw after 300 Cycles (ASTM)    | No visible damage after 300 cycles    |          |

Calcium aluminate shall be designed to withstand long term exposure to a bacterially corrosive hydrogen sulfide environment that may be expected to produce a pH of 1 on normal Portland cement based concrete.

The water used for mixing shall be clean, potable water, free from injurious amounts of oil, acid, alkali, vegetable, sewage and/or organic matter.

All patching, infiltration control, and grouting material shall used to stop infiltration flows in accordance with the manufacturer's recommendations and meet the following strength requirements:

|                                   |           |            |
|-----------------------------------|-----------|------------|
| Compressive Strength (ASTM C597B) | 600 psi   | (24 hours) |
|                                   | 1,000 psi | (7 days)   |
| Bond Strength (ASTM C321)         | 30 psi    | (1 hour)   |
|                                   | 80 psi    | (1 day)    |

Prior to spraying liner, Contractor shall ensure all surfaces are clean and free of laitance and/or loose material. Surfaces to be sprayed on shall be thoroughly saturated with water prior to application of lining materials, but free of any running water.

All equipment necessary to gauge, control, mix and monitor amounts of all component materials necessary to complete the lining installation shall be provided by the Contractor. Equipment to apply the calcium aluminate shall be of spray type and approved by the material manufacturer.

Lining materials shall be thoroughly mixed by mechanical means to ensure all agglomerated particles are reduced to original size prior to placement into spray equipment.

Liner shall be applied from an angle as nearly perpendicular to the surface as practicable, with the nozzle held at least one (1) foot from the surface to achieve a maximum material compaction with minimum rebound and no visible "sag".

The minimum thickness for calcium aluminate liner shall be ½ inch over all surfaces. The time interval between successive layers of material application must be sufficient to allow “tackiness” to develop but not fully set.

Calcium aluminate liner must be cured in a moist environment. If it is determined that the environment is moist enough to allow natural curing, a compound meeting the requirements of ASTM C309 shall be applied to all lined surfaces. Curing compound shall have the approval of the lining material manufacturer and the Engineer prior to use.

In lieu of the curing compound, moist curing may be used. Contractor shall allow the calcium aluminate liner to moist cure for a minimum of 18 hours. Moist curing can consist of the use of soaker hoses, water sprinklers, or vapor/misting machines.

At the Engineers discretion, the Contractor may perform an exfiltration test by using a static water head test on the rehabilitated manholes. For manholes zero (0) to six (6) feet deep, if water loss is one (1) inch or less in five (5) minutes the manhole reconstruction is acceptable. For manholes over six (6) feet deep, if water loss is one (1) inch plus 1/8 inch for each additional foot of depth or less in five (5) minutes, manhole is acceptable.

Payment shall be at the contract unit price bid per each manhole rehabilitated and shall include full compensation for furnishing all labor, materials, tools and equipment and for performing all work necessary to complete this item in place.

#### **Item No. 4 Manhole Bench to Construct**

A manhole bench shall be constructed in manholes indicated in the Drawings, in accordance with these Special Provisions, and as directed by the Engineer.

Contractor shall prepare manhole by removing all unsound concrete, oil, grease, laitance and debris by use of a high pressure water spray before any work begins. No trash or debris, other than wastewater, is allowed to be discharged into the sewer line.

Manhole bench shall be constructed of non-shrink grout, and shall be “Non-shrink Multipurpose Grout Cement All”. By Rapid Set, or approved equal. Non-shrink grout shall conform to ASTM C1107 and ASTM C928. The minimum compressive strength shall be 7400 psi at 28 days, per ASTM C109. Bonding emulsion additive shall be mixed into non-shrink grout and shall be SB Bonding Emulsion by Koester American Corp., or approved equal.

Non-shrink grout and bonding emulsion additive shall be mixed and placed in accordance with manufacture’s instructions, and mixed with only clean potable water. Use the minimum possible trowel strokes and minimum pressure when troweling. Do not re-finish already troweled surfaces.

Manhole bench shall slope upwards from the spring line of the pipe to the projected level of the crown of the pipe at the manhole wall or twelve (12) inches above the spring line, whichever is less. All holes, cracks and seams shall be grouted flush with the manhole interior. All internal surfaces shall have a smooth finish. Contractor shall apply non-shrink grout to any and all defects such that the finished surface is smooth and free of rock

pockets, voids, gaps, and holes.

Payment shall be at the unit price bid per each manhole bench constructed, and shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all work necessary to complete this item in place.

#### **Item No. 5 Flowline to Construct**

Contractor shall install a new flowline of vitrified clay in selected manholes as indicated in the Drawings (located in Appendix A of these Special Provisions) in conformance with Section 10 of the Standard Specifications, and as directed by the Engineer.

New flowline shall match inlet and outlet pipe elevations and shall extend to inside face of manhole. If inlet and outlet pipes are of different sizes, new flowline pipe size shall match larger pipe size. If the entire clay flow channel does not fit through the existing manhole opening, it is acceptable to cut the clay flow channel into the minimum number of pieces and reassemble and construct the flowline, grouting every piece smooth.

Contractor shall remove all unsound concrete, oil, grease, laitance, and debris by use of a high pressure water spray. No trash or debris, other than wastewater, shall be discharged via the sewer line. Existing flowline channel shall be saw cut, chipped, and removed to create a gap a minimum of two (2) inches and a maximum of three (3) inches between the bottom of the new flowline and the chipped surface. Prior to placement of flowline clay pipe, all surface that comes in contact with the grout shall be saturated with water. After saturation, all excess water shall be removed, leaving no puddles.

Grout shall be "Non-shrink Multipurpose Grout Cement All", by Rapid Set, or approved equal. Non-shrink grout shall conform to ASTM C1107 and ASTM C928. Minimum compressive strength shall be 7400 psi at 28 days, per ASTM C109. Bonding emulsion additive shall be mixed into non-shrink grout and shall be SB Bonding Emulsion by Koester American Corp., or approved equal.

Payment shall be at the unit price bid per each flowline installed, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work necessary to complete this item in place.

#### **Item No. 6 Rungs to Remove**

Contractor shall remove all ladder rungs from selected manholes as indicated on the Drawings, and as directed by the Engineer. Where possible, rungs shall be completely removed, including embedded portion. If embedded portion cannot be completely removed, Contractor shall remove enough rung to leave at least a one (1) inch deep hole. Manhole wall shall then be grouted smooth with Non-shrink Multipurpose Grout Cement All, or equal.

Payment shall be at the unit price paid per each manhole where rungs were removed, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work necessary to complete this item in place.

**Item No. 7 Head and Cover to Adjust**

Contractor shall adjust to grade existing manhole head and cover where indicated in the Drawings, in accordance with Section 25-4 of the Standard Specifications, and as directed by the Engineer.

Payment shall be at the unit price bid per each manhole head and cover adjusted, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work necessary to complete this item in place.

**Item No. 8 Drop-In Connection to Construct**

An inside or outside drop connection shall be constructed at selected manholes as shown on the Drawings, shall conform to Section 38, DWG. No. S-130, of the Standard Specifications, and as directed by the Engineer.

The dimensions shown as two (2) inches on DWG. No. S-130 and that reads "CUT THIS END OF THE TEE AS SHOWN" shall be amended to read "HALF THE DIAMETER OF THE LATERAL PIPE".

Payment shall be at the unit price bid for each drop connection and shall include all labor, materials, tools, equipment and incidentals for doing all work necessary to complete this item complete in place.

**END OF SPECIAL PROVISIONS**

## **APPENDIX A**

General Construction Notes

Summary of Manholes

Vicinity Map

Drawings

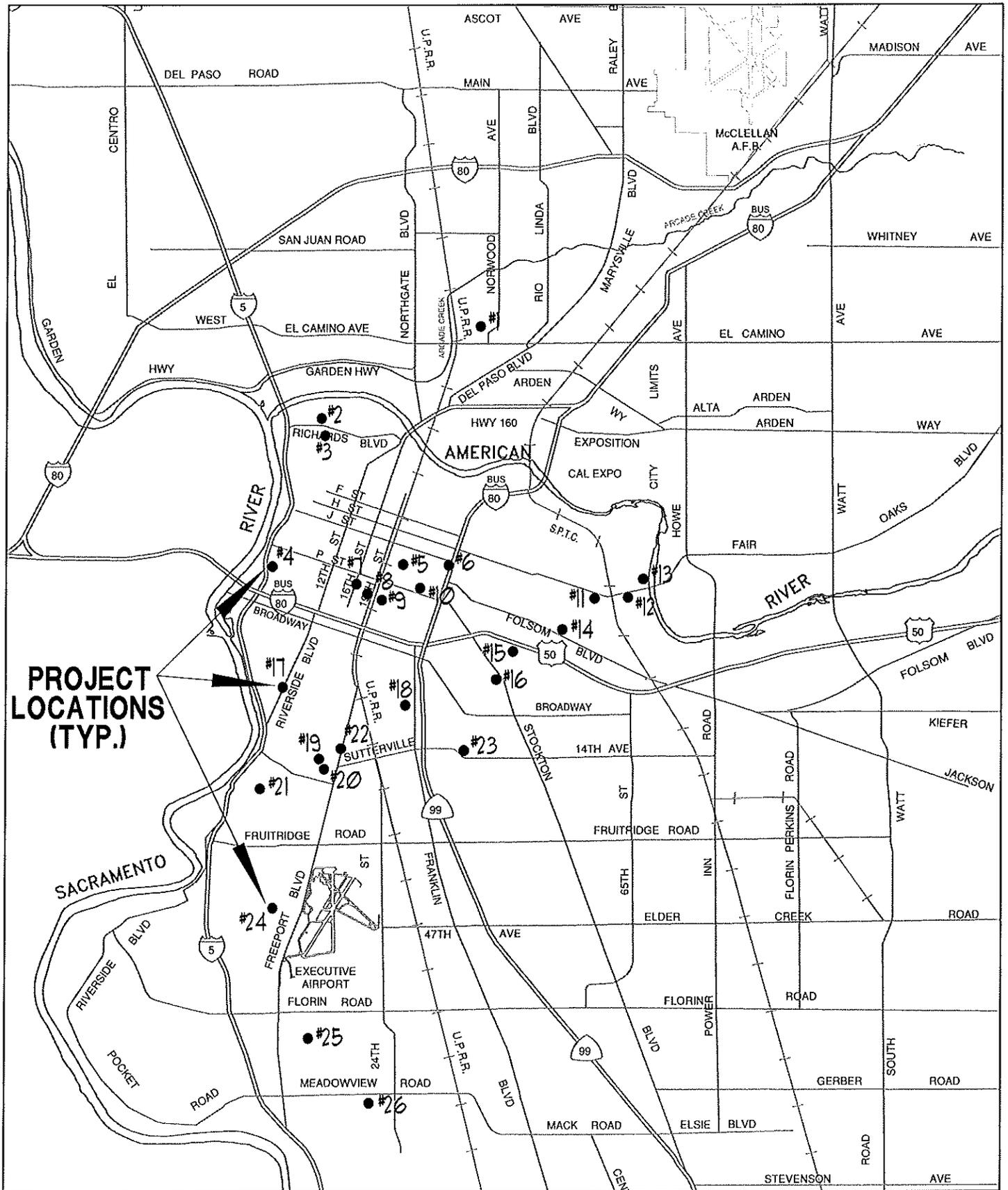
Legend

## GENERAL CONSTRUCTION NOTES

1. Construction shall conform to City of Sacramento Standard Specifications, dated June 2007 and these Special Provisions.
2. The Contractor shall contact Brett Grant (808-1413) of the Department of Utilities, Construction Inspection Section at least two (2) working days before beginning work for the scheduling of construction inspection.
3. The Contractor is responsible for determining the exact location of all existing utilities and for the protection and repair of damage to them. The Contractor shall contact Underground Service Alert (1-800-227-2600) two (2) working days before work is to begin.
4. The Contractor shall be responsible for the protection of all existing survey monuments or markers during construction.
5. For all trench excavations five (5) feet or more in depth, the Contractor shall obtain a permit from the Division of Industrial Safety (2422 Arden Way, Suite 55, Sacramento - Phone 920-6123) prior to beginning any excavation. A copy of this permit shall be available at the construction site at all times.
6. Exact limits of pavement removal and reconstruction shall be determined in the field by the Engineer.
7. Demolition of existing features shall be limited to the items shown on the Drawings and described in the Special Provisions. It shall be the Contractor's responsibility to repair and/or replace all existing improvements damaged by his operations at no additional expense to the City.
8. If unusual amounts of bone, stone or artifacts are uncovered, work within 50 meters of the area shall cease immediately and a qualified archaeologist shall be consulted to develop, if necessary, further mitigation measures to reduce any archaeological impact to a less than significant effect before construction resumes in the area.
9. The Contractor shall field verify all information to accuracy and completeness prior to ordering materials or beginning fabrication.
10. Aerial utilities are not shown on these drawings. The Contractor is responsible for making all necessary adjustments and safety precaution at no additional charge to the City.

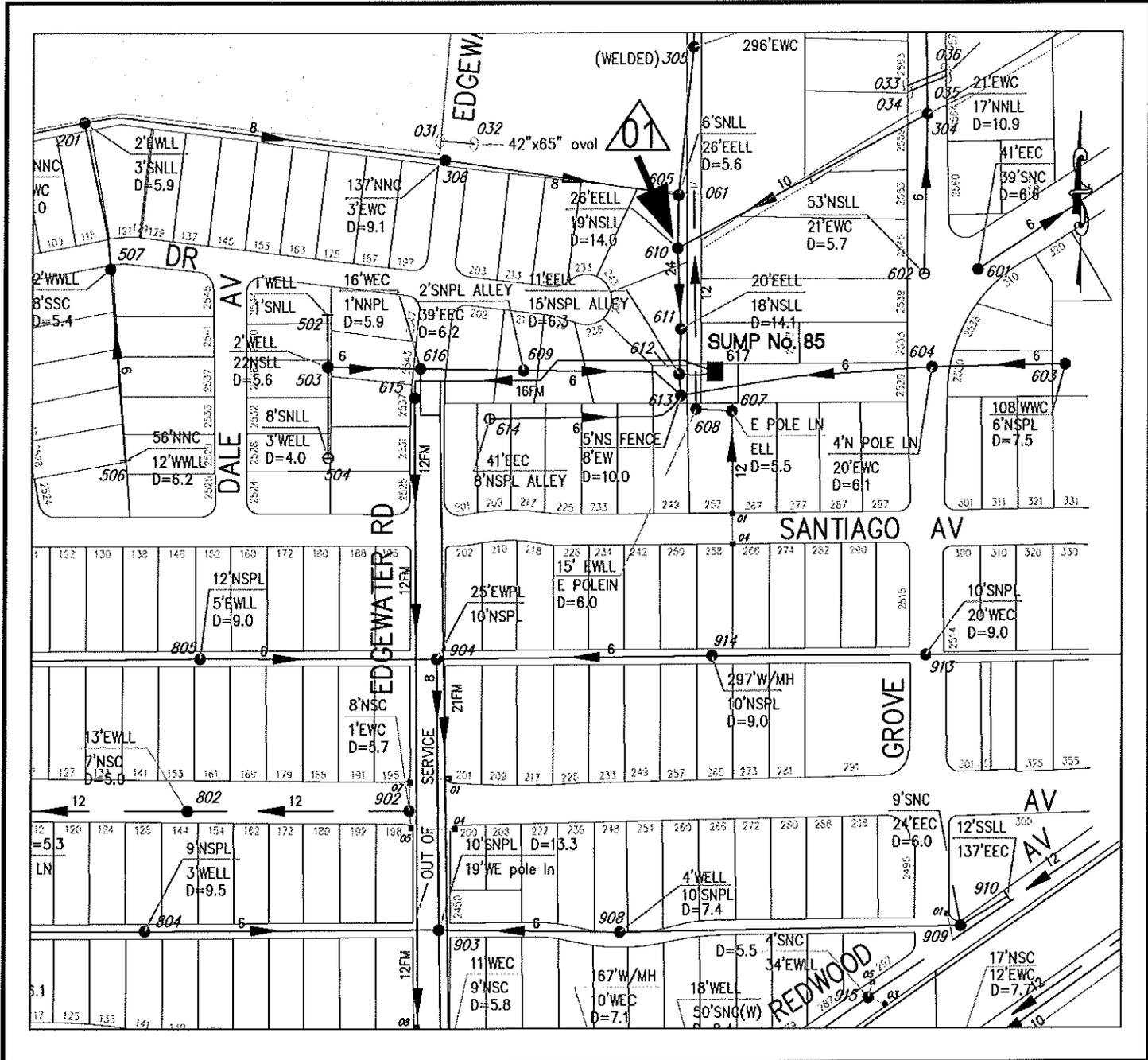
## SUMMARY OF MANHOLES

| No. | MH No.   | Main Size (in) | Depth (ft) | Rehab MH                       | Construct Bench | Construct Flowline | Remove Rungs | Adjust Head & Cover | Drop-in Connection |  |
|-----|----------|----------------|------------|--------------------------------|-----------------|--------------------|--------------|---------------------|--------------------|--|
| 1   | 610/W17  | 24             | 14         | ✓                              |                 |                    |              |                     |                    |  |
| 2   | 205/Z14  | 10             | 6.7        | ✓                              | ✓               |                    |              |                     |                    |  |
| 3   | 511/Z14  | 24             | 6.6        | ✓                              | ✓               |                    |              |                     |                    |  |
| 4   | 521/DD13 | 8              | 4.7        | ✓                              | ✓               | ✓                  |              | ✓                   |                    |  |
| 5   | 724/DD16 | 18             | 5.7        | ✓                              | ✓               | ✓                  |              |                     |                    |  |
| 6   | 407/DD17 | 10             | 5.8        | ✓                              | ✓               | ✓                  | ✓            |                     |                    |  |
| 7   | 119/EE15 | 8              | 2.9        |                                | ✓               | ✓                  |              |                     |                    |  |
| 8   | 524/EE15 | 8              | 3.5        | REMOVE (E) MH, CONSTRUCT MH #3 |                 |                    |              |                     |                    |  |
| 9   | 908/EE15 | 8              | 3.6        | REMOVE (E) MH, CONSTRUCT MH #3 |                 |                    |              |                     |                    |  |
| 10  | 201/EE16 | 8              | 5.9        | ✓                              | ✓               |                    |              |                     | ✓                  |  |
| 11  | 705/EE20 | 8              | 8.7        | ✓                              | ✓               | ✓                  | ✓            |                     | ✓(2)               |  |
| 12  | 813/EE20 | 8              | 8.5        | ✓                              | ✓               | ✓                  |              |                     | ✓                  |  |
| 13  | 107/EE21 | 6              | 4.6        |                                | ✓               |                    |              |                     |                    |  |
| 14  | 813/FF19 | 10             | 7.1        | ✓                              | ✓               |                    |              |                     |                    |  |
| 15  | 508/GG18 | 22             | 8          | ✓                              | ✓               |                    | ✓            |                     |                    |  |
| 16  | 107/HH18 | 8              | 8          | ✓                              |                 |                    |              |                     |                    |  |
| 17  | 804/HH13 | 60             | 17.3       | ✓                              |                 |                    |              |                     |                    |  |
| 18  | 108/II16 | 8              | 6          |                                | ✓               |                    |              |                     |                    |  |
| 19  | 907/JJ13 | 8              | 14.7       | ✓                              | ✓               |                    |              |                     | ✓                  |  |
| 20  | 219/KK13 | 8              | UNK        | ✓                              |                 | ✓                  |              |                     |                    |  |
| 21  | 723/KK13 | 8              | 7.5        | ✓                              |                 |                    |              |                     |                    |  |
| 22  | 607/JJ14 | 16             | 10.2       |                                | ✓               |                    |              |                     |                    |  |
| 23  | 409/JJ17 | 8              | 6.6        | ✓                              |                 | ✓                  |              |                     |                    |  |
| 24  | 509/OO13 | 6              | 13.5       | ✓                              |                 |                    |              | ✓                   |                    |  |
| 25  | 710/SS14 | 6              | 10         | ✓                              |                 |                    |              |                     |                    |  |
| 26  | 508/UU15 | 6              | UNK        | ✓                              | ✓               | ✓                  |              | ✓                   |                    |  |



**PROJECT  
LOCATIONS  
(TYP.)**

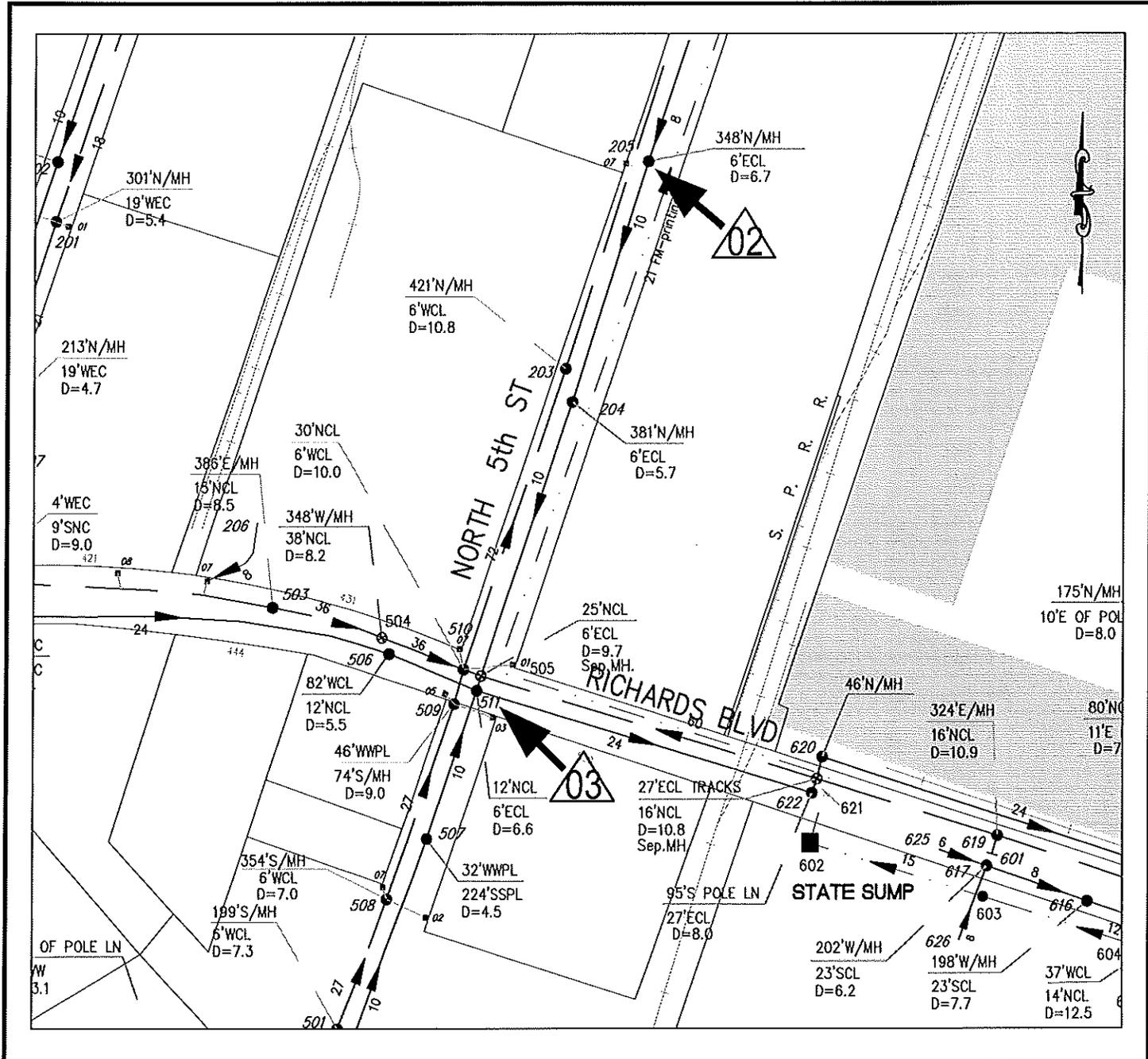
**RECONSTRUCTION OF MISC. SEWER MANHOLES 2012  
(PN: X14110400)**



N.T.S.

| No. | MH No.  | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|---------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 01  | 610/W17 | 277-G6    | 24        | 14.0       | ✓      |             |           |        |                   |                    |

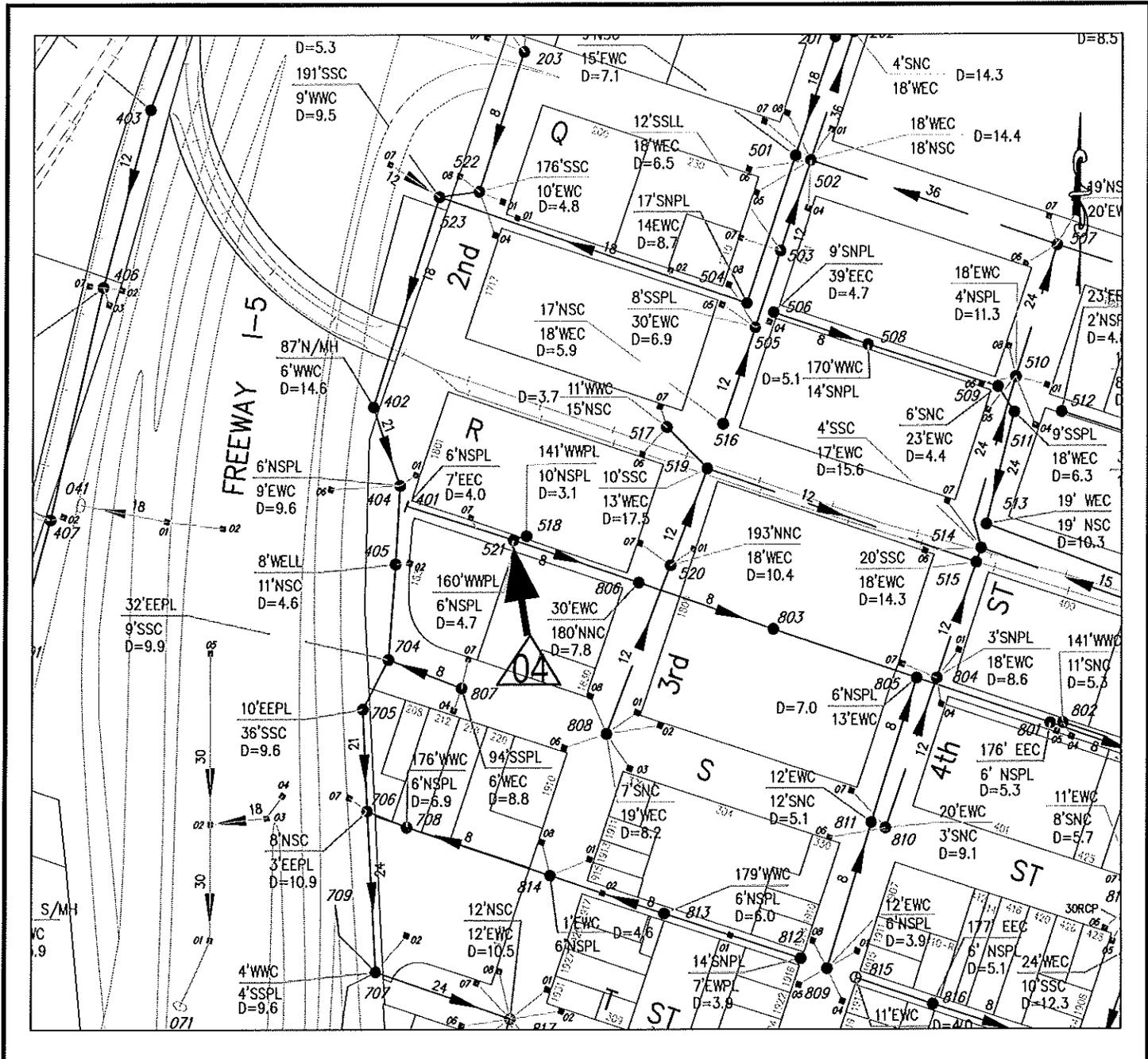
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide page.



N.T.S.

| No. | MH No.  | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct f | remove rungs | adj. head & cover | drop-in connection |
|-----|---------|-----------|-----------|------------|--------|-------------|-------------|--------------|-------------------|--------------------|
| 02  | 205/Z14 | 297-C1    | 10        | 6.7        | ✓      | ✓           |             |              |                   |                    |
| 03  | 511/Z14 | 297-C1    | 24        | 6.6        | ✓      | ✓           |             |              |                   |                    |

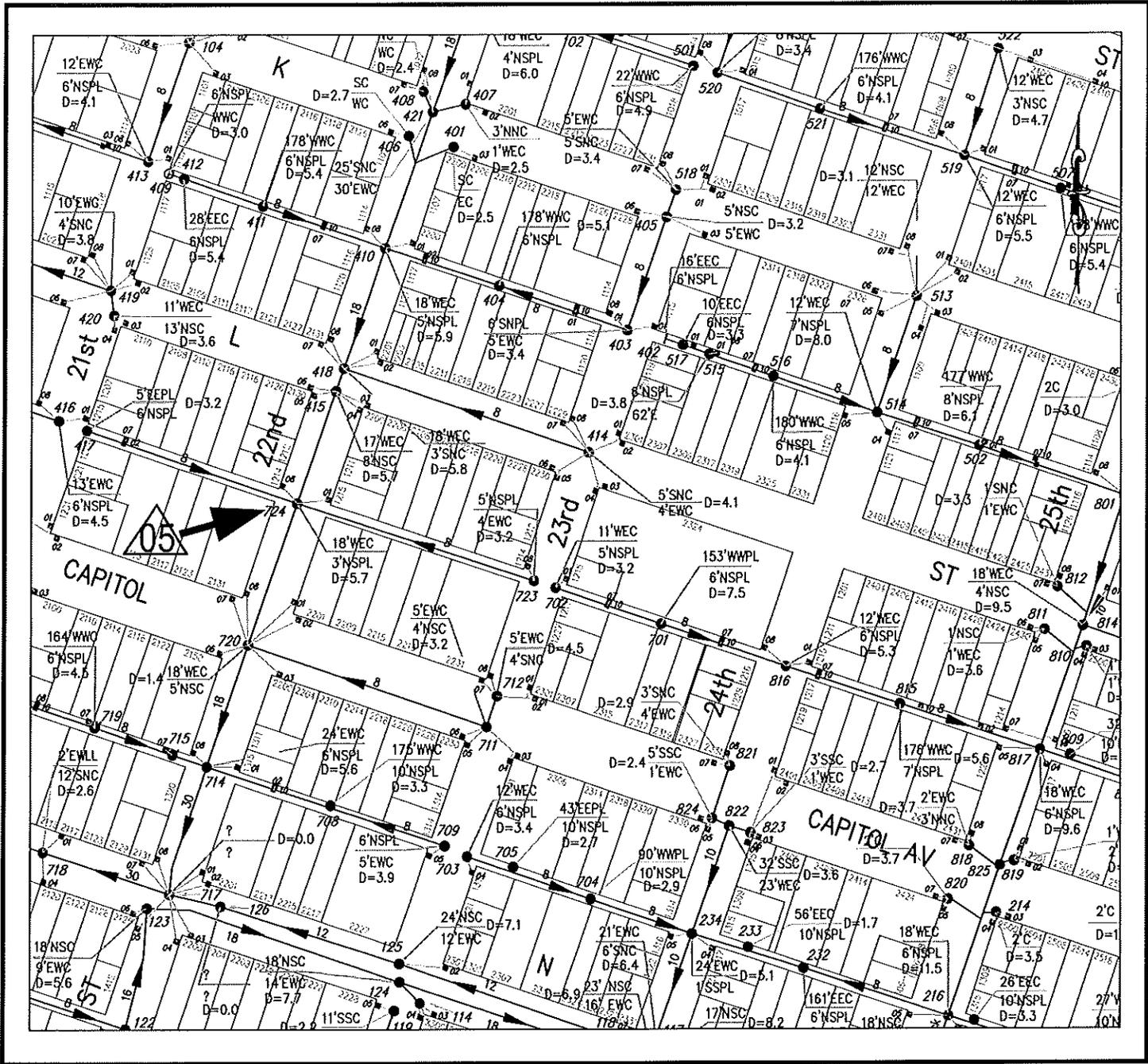
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove rungs | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------------|-------------------|--------------------|
| 04  | 521/DD13 | 297-B4    | 8         | 4.7        | ✓      | ✓           | ✓         |              | ✓                 |                    |

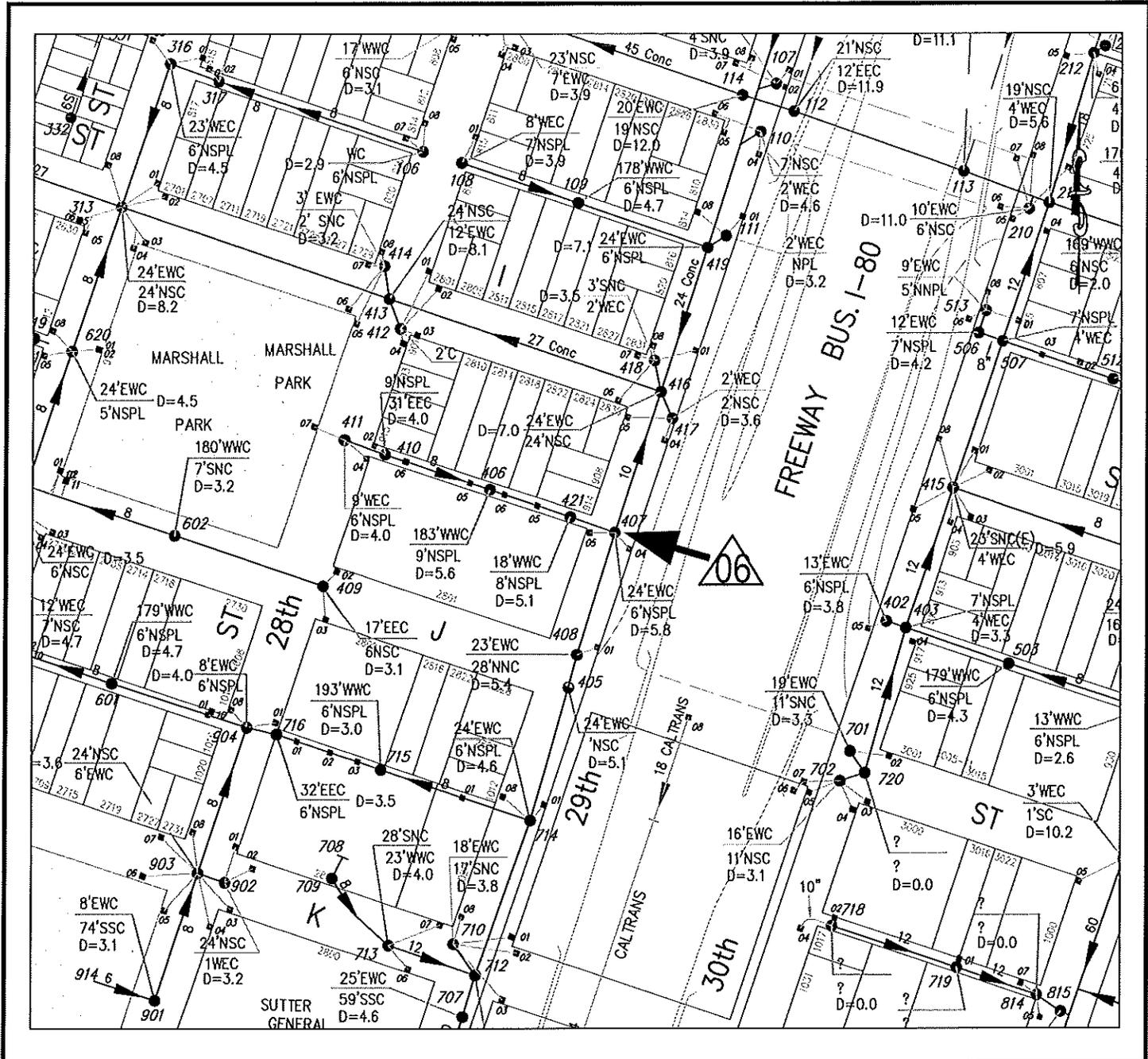
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 05  | 724/DD16 | 297-E4    | 18        | 5.7        | ✓      | ✓           | ✓         |        |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.

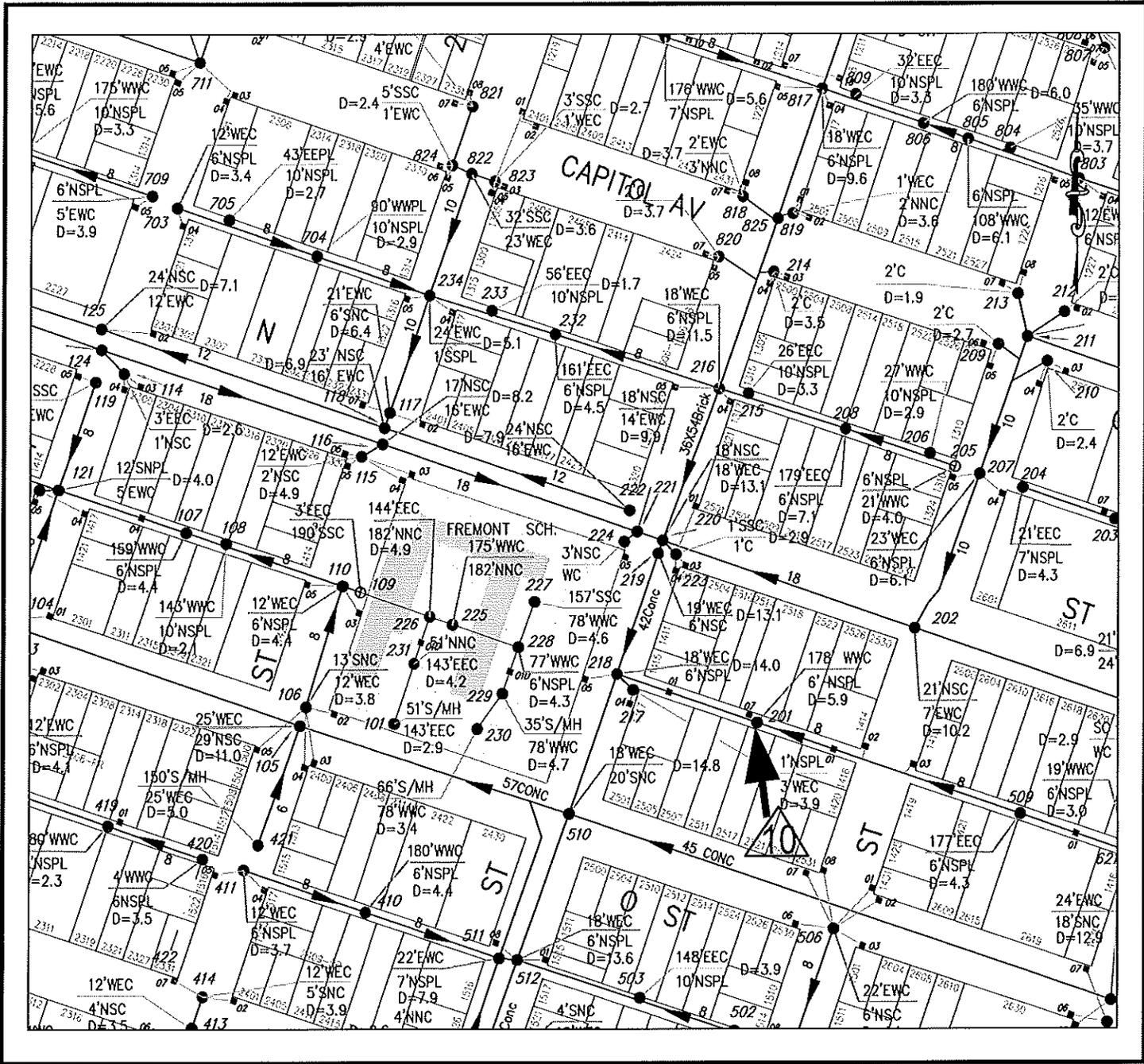


N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 06  | 407/DD17 | 297-F4    | 10        | 5.8        | ✓      | ✓           | ✓         | ✓      |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.

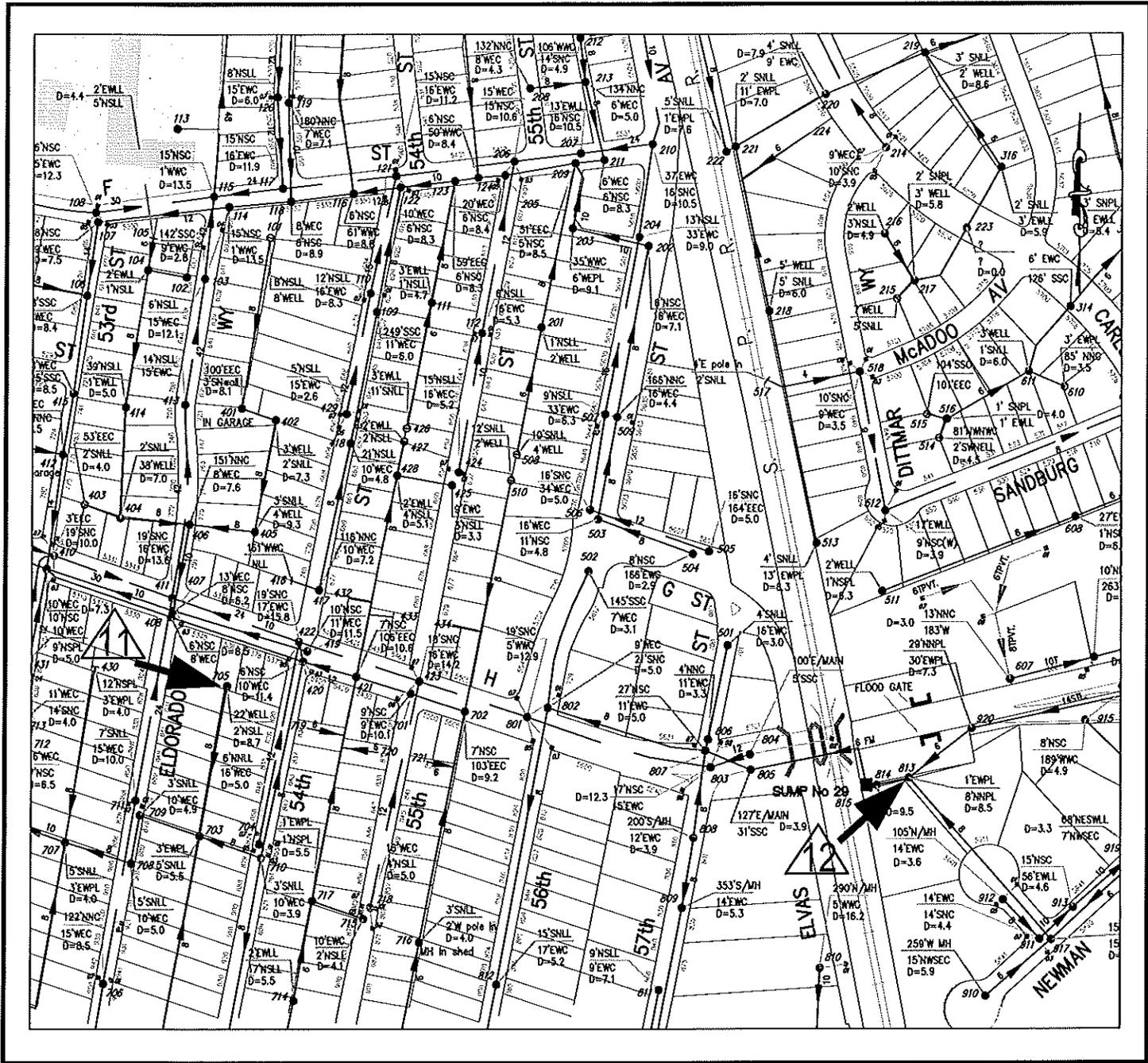




N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove rungs | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------------|-------------------|--------------------|
|     | 201/EE16 | 297-E5    | 8         | 5.9        | ✓      | ✓           |           |              |                   | ✓                  |

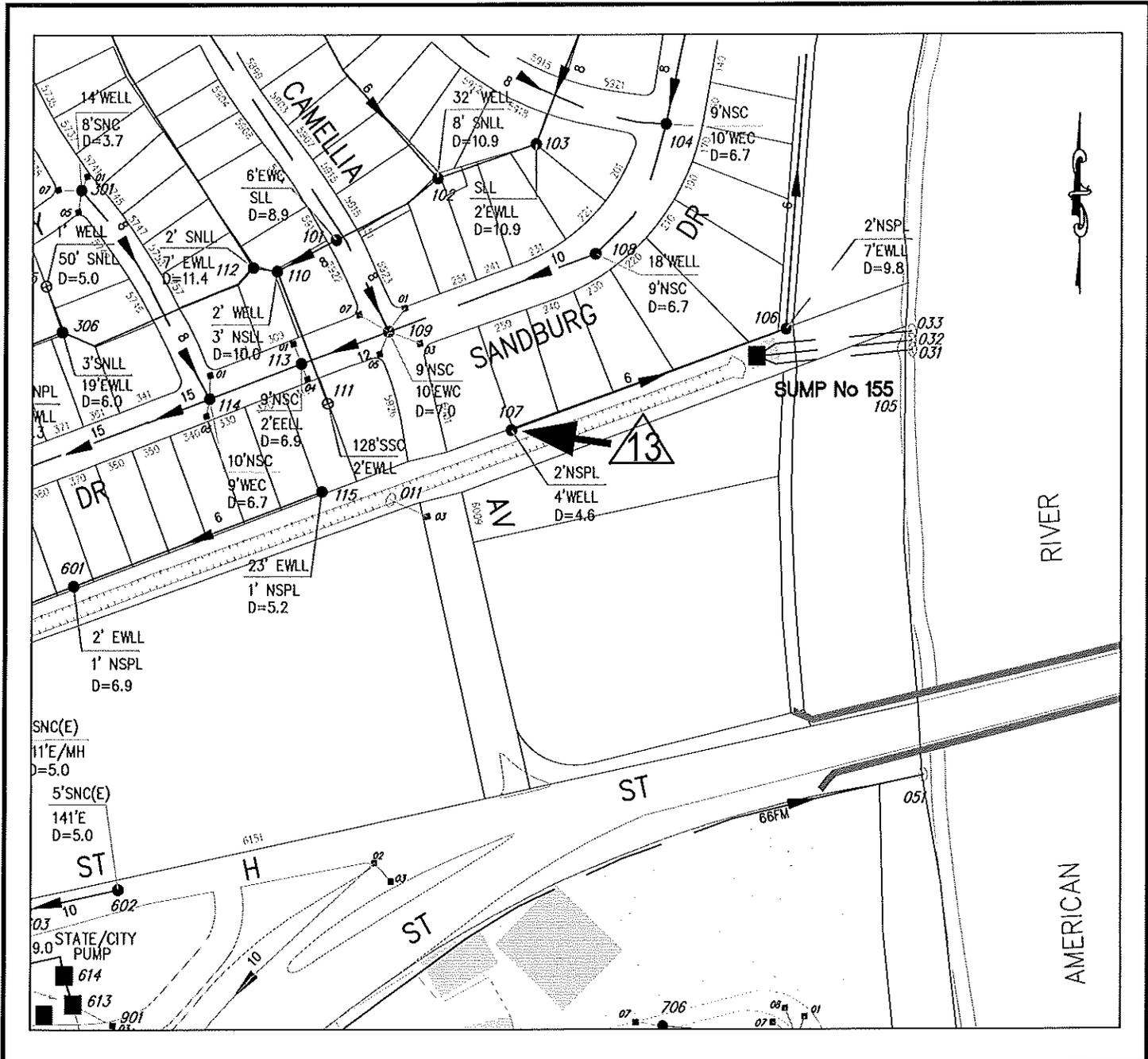
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 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove rungs | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------------|-------------------|--------------------|
| 11  | 705/EE20 | 298-A5    | 8         | 8.7        | ✓      | ✓           | ✓         | ✓            |                   | ✓(2)               |
| 12  | 813/EE20 | 298-A5    | 8         | 8.5        | ✓      | ✓           | ✓         |              |                   | ✓                  |

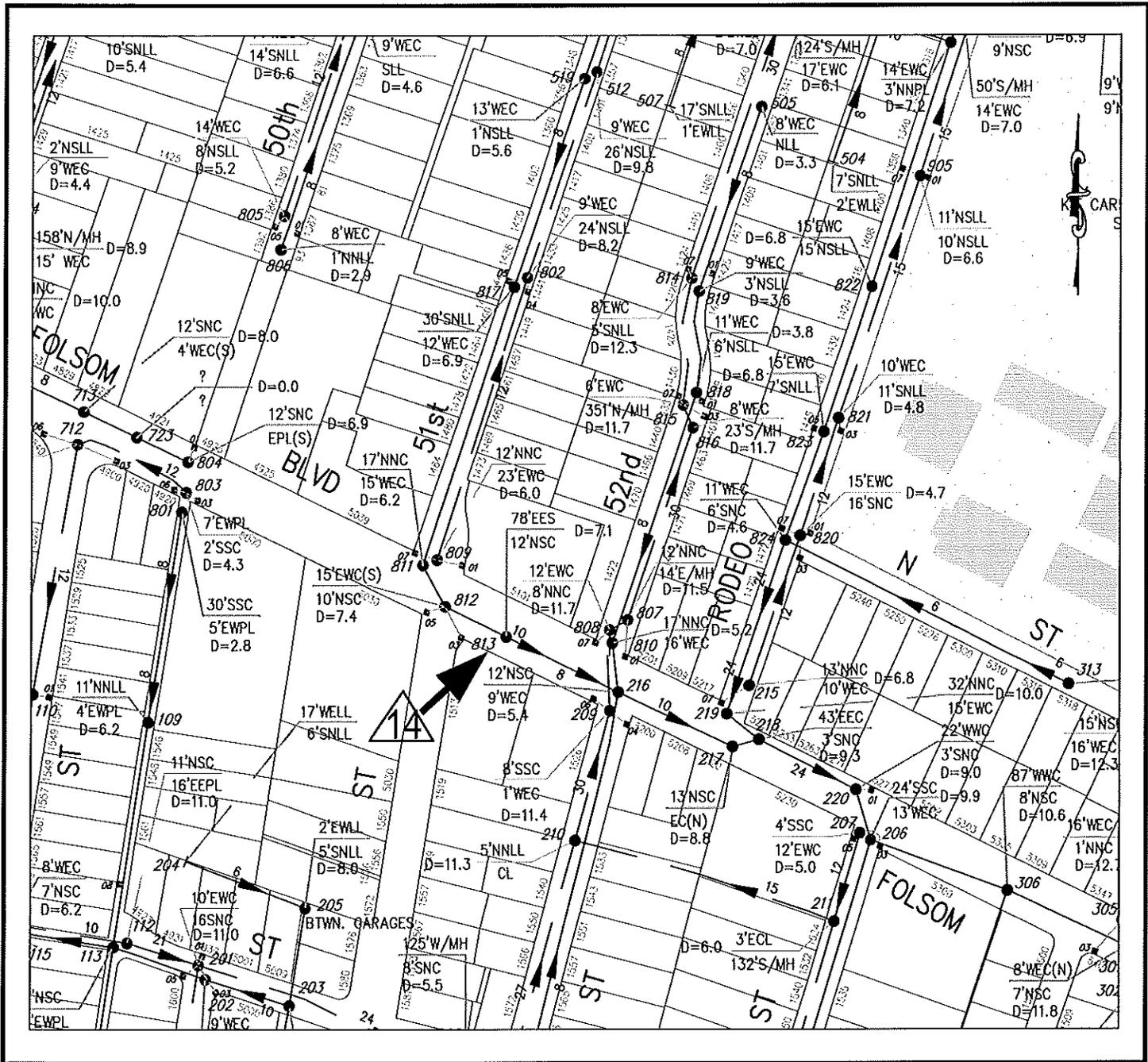
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove rungs | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------------|-------------------|--------------------|
| 13  | 107/EE21 | 298-B5    | 6         | 4.6        |        | ✓           |           |              |                   |                    |

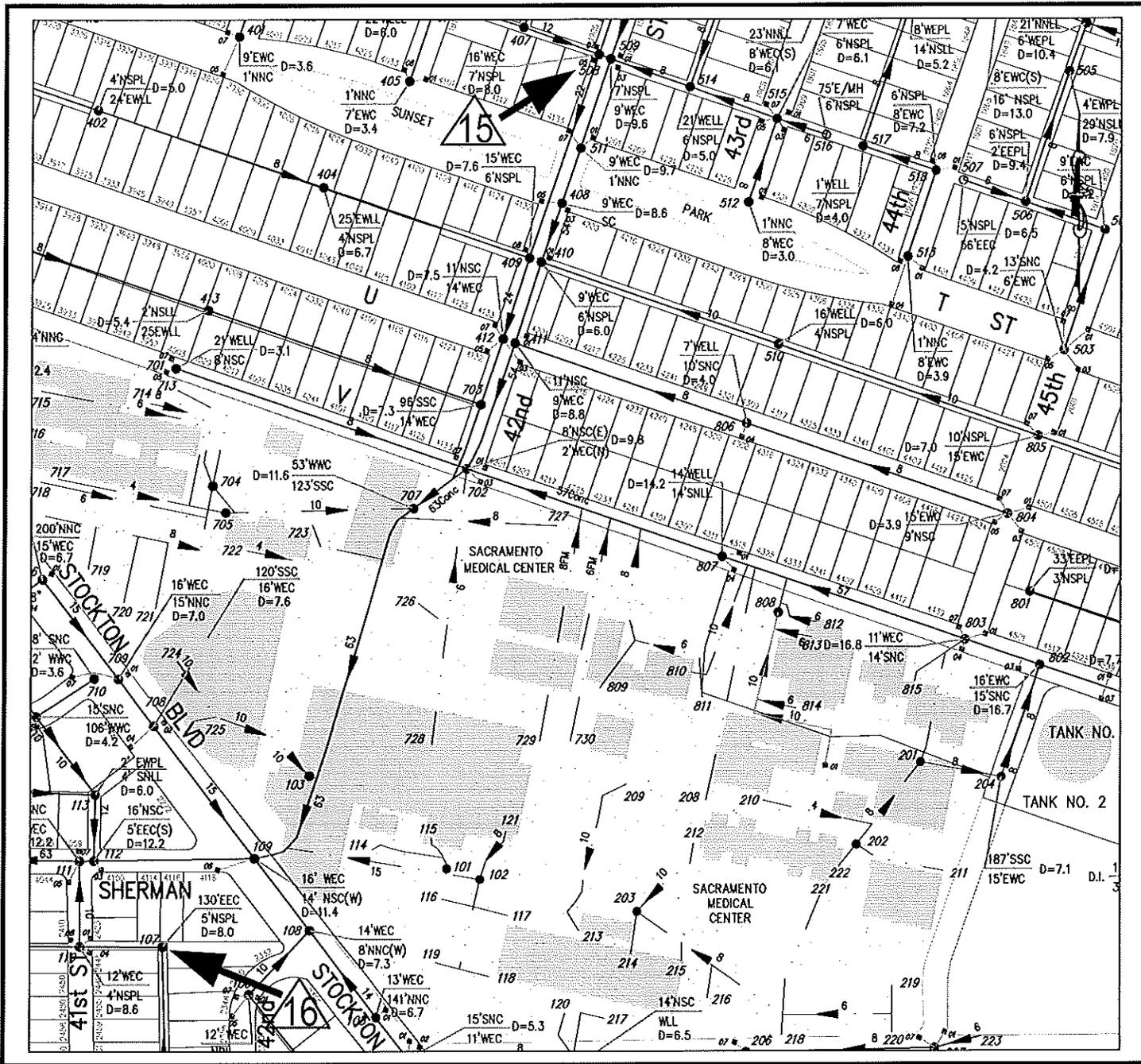
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 14  | 813/FF19 | 297-J6    | 10        | 7.1        | ✓      | ✓           |           |        |                   |                    |

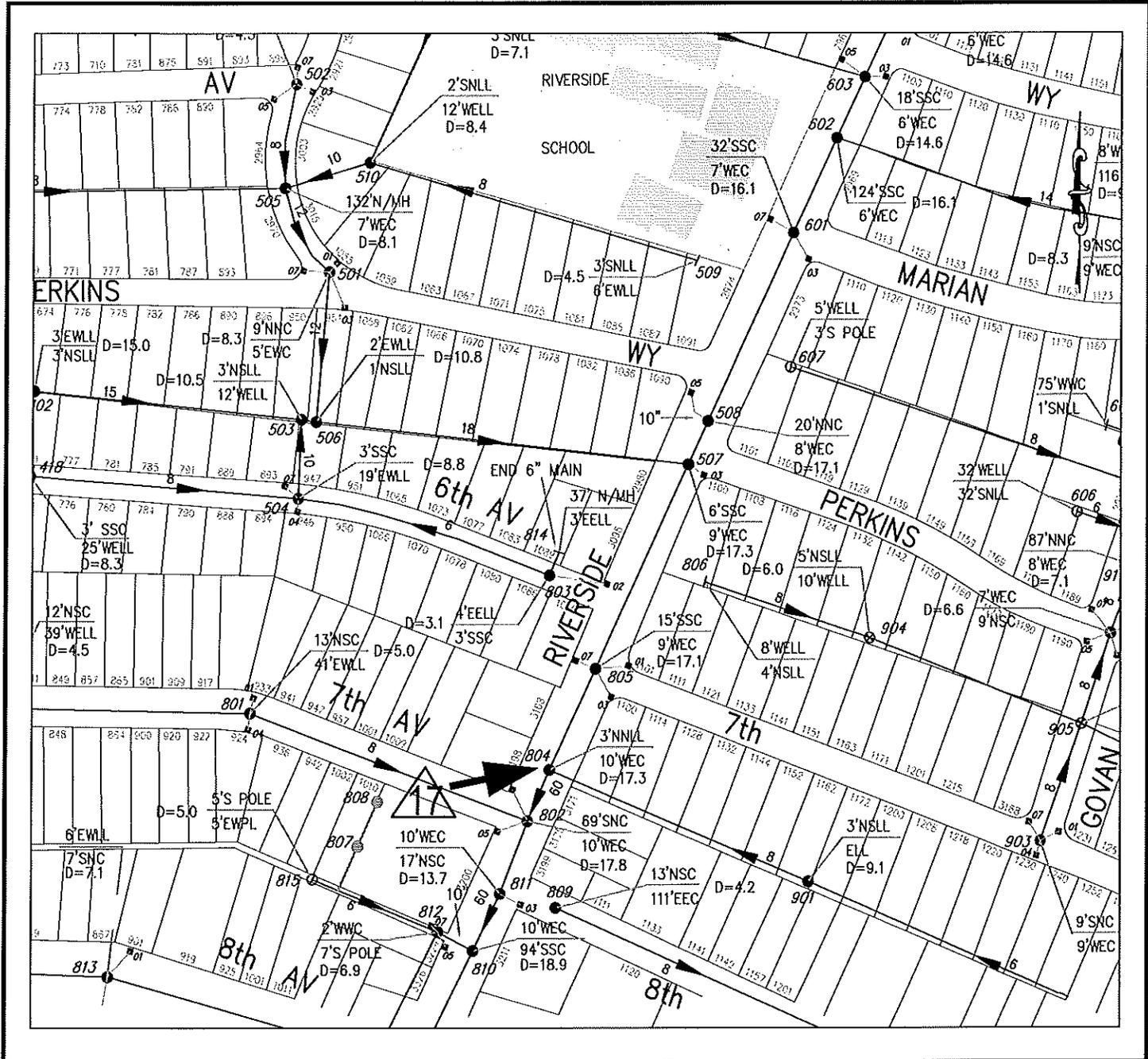
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 15  | 508/GG18 | 297-H7    | 22        | 8.0        | ✓      | ✓           |           | ✓      |                   |                    |
| 16  | 107/HH18 | 297-G7    | 8         | 8.0        | ✓      |             |           |        |                   |                    |

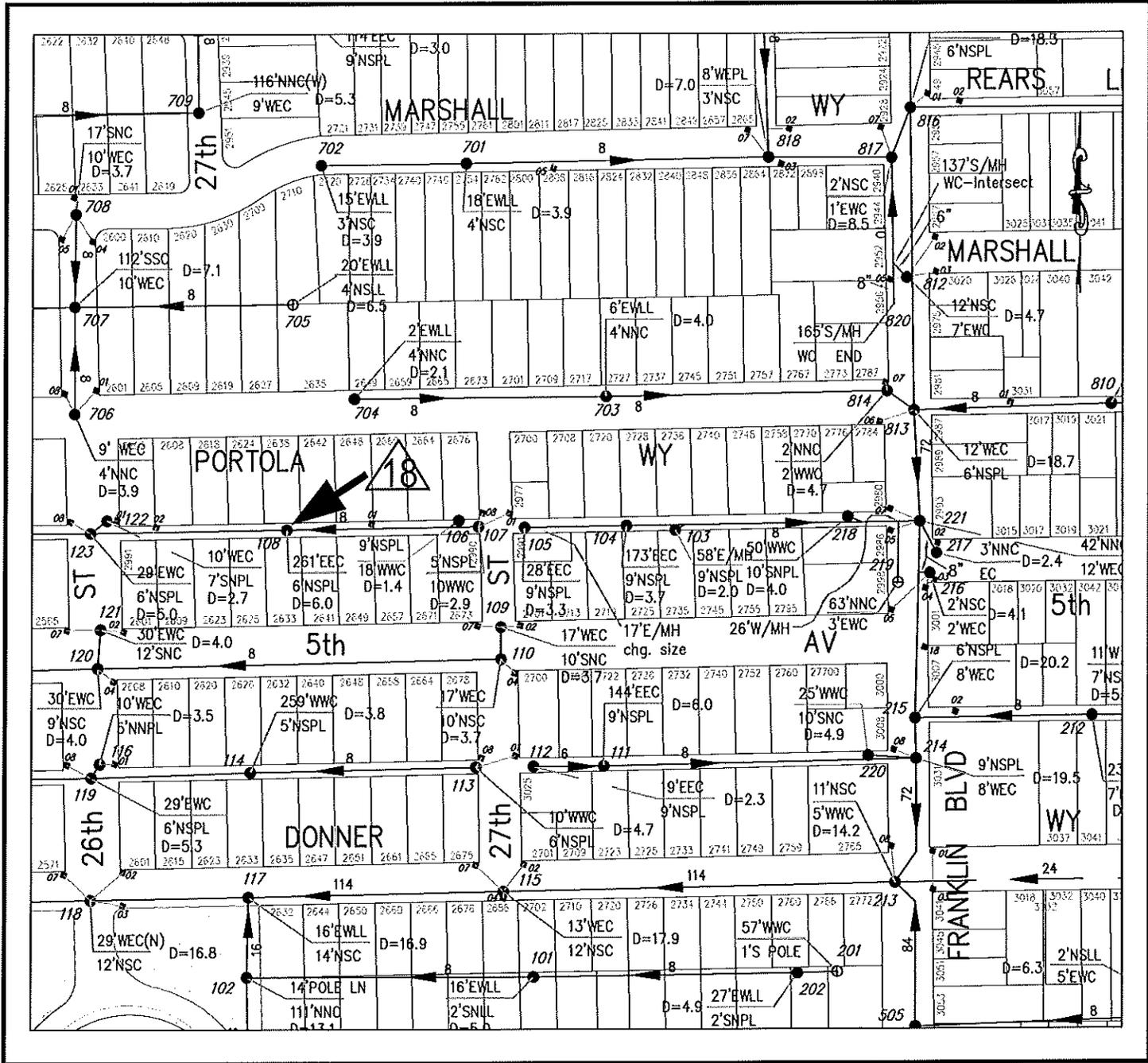
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
|     | 804/HH13 | 317-B1    | 60        | 17.3       | ✓      |             |           |        |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



N.T.S.

| No. | MH No.  | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove rungs | adj. head & cover | drop-in connection |
|-----|---------|-----------|-----------|------------|--------|-------------|-----------|--------------|-------------------|--------------------|
| 18  | 108/116 | 317-E1    | 8         | 6.0        |        | ✓           |           |              |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.

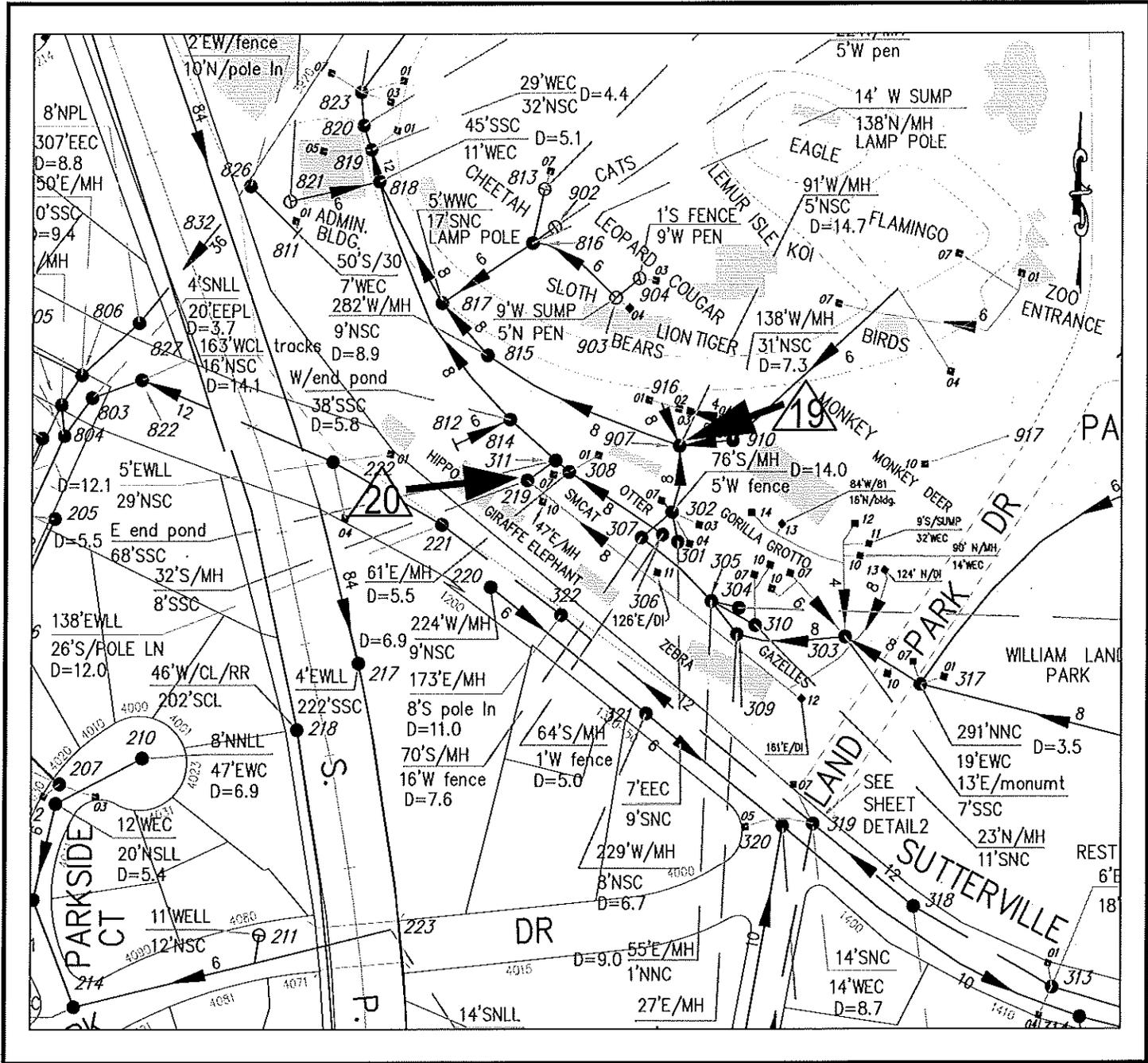


CITY OF SACRAMENTO  
DEPARTMENT OF UTILITIES

RECONSTRUCTION OF MISC. SEWER MAINTENANCE HOLES 2012

LOCATION 18

10 of 56  
13

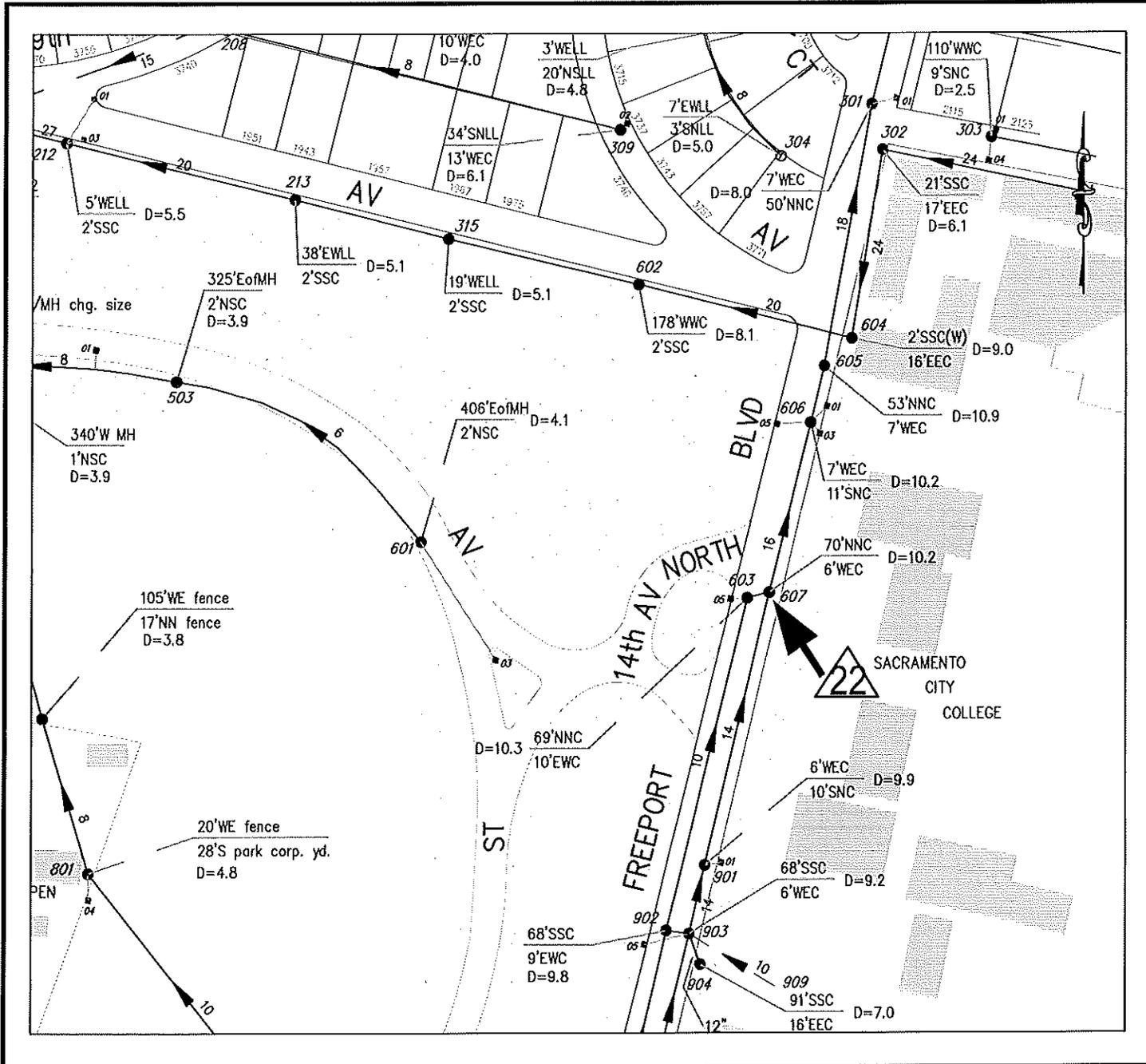


N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 19  | 907/JJ13 | 317-B2    | 8         | 14.7       | ✓      | ✓           |           |        |                   | ✓                  |
| 20  | 219/KK13 | 317-B2    | 8         | UNK        | ✓      |             | ✓         |        |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



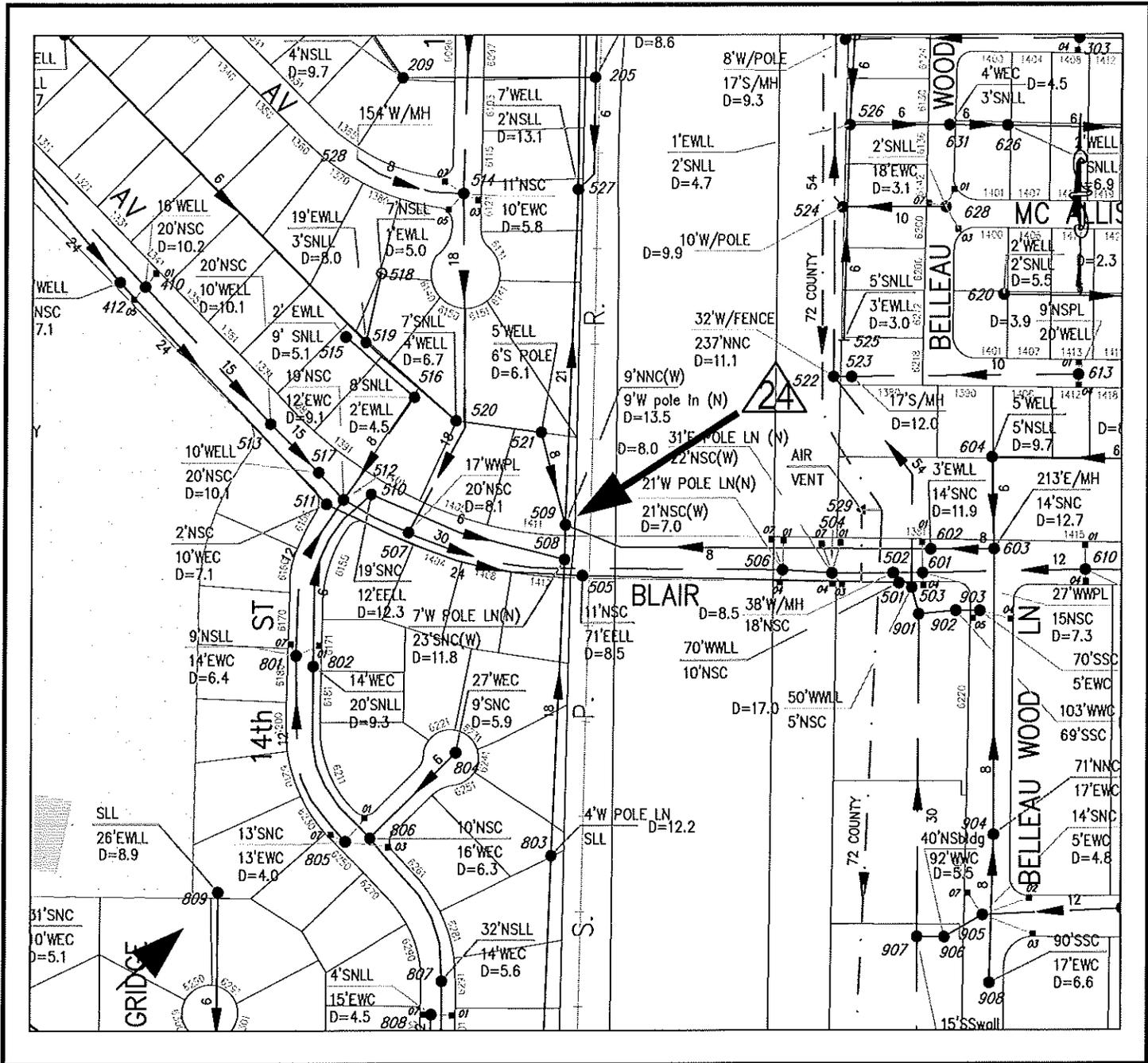


N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 22  | 607/JJ14 | 317-D2    | 16        | 10.2       |        | ✓           |           |        |                   |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.



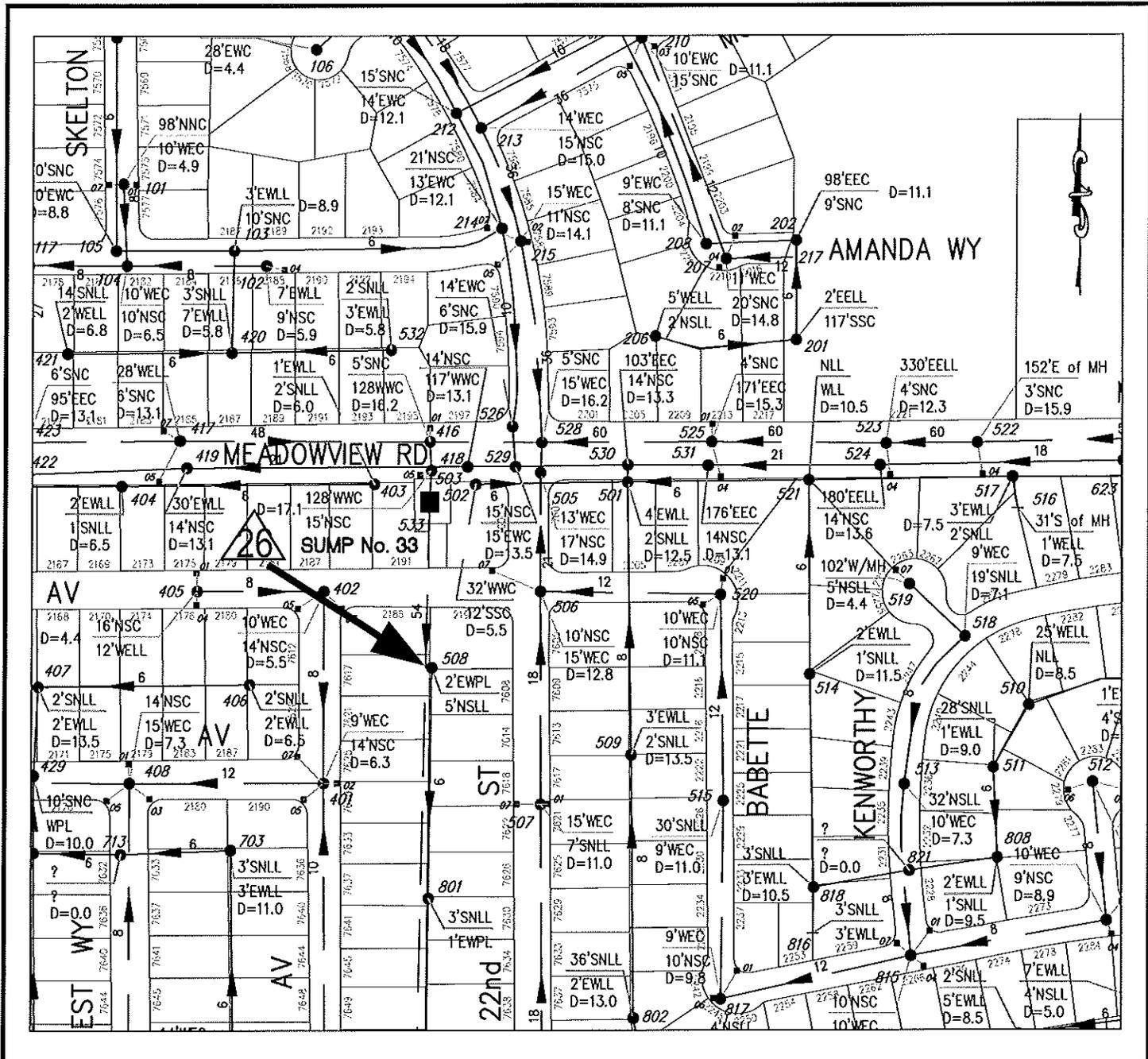


N.T.S.

| No. | MH No.   | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|----------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 24  | 509/0013 | 317-B6    | 6         | 13.5       | ✓      |             |           |        | ✓                 |                    |

**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.





N.T.S.

| No. | MH No.  | Grid Page | Main Size | Depth (ft) | Rehab. | slope bench | construct | remove | adj. head & cover | drop-in connection |
|-----|---------|-----------|-----------|------------|--------|-------------|-----------|--------|-------------------|--------------------|
| 26  | 50/UJ15 | 337-D3    | 6         | UNK        | ✓      | ✓           | ✓         |        | ✓                 |                    |

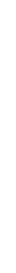
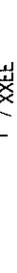
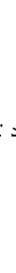
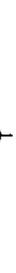
**Note:** 1. "Depth", where shown, is approximate and denotes distance from M.H. rim to the deepest pipe flowline.  
 2. Grid page is The Thomas Guide grid.

# LEGEND

## ABBREVIATIONS

|              |                                   |
|--------------|-----------------------------------|
| NE           | NORTHEAST                         |
| SN           | SOUTH OF NORTH                    |
| NS           | NORTH OF SOUTH                    |
| NNC          | NORTH OF NORTH CURB               |
| SSC          | SOUTH OF SOUTH CURB               |
| NSC          | NORTH OF SOUTH CURB               |
| SNC          | SOUTH OF NORTH CURB               |
| WWC          | WEST OF WEST CURB                 |
| EEC          | EAST OF EAST CURB                 |
| EW           | EAST OF WEST CURB                 |
| WEC          | WEST OF EAST CURB                 |
| SC           | SOUTH CURB                        |
| NC           | NORTH CURB                        |
| EC           | EAST CURB                         |
| WC           | WEST CURB                         |
| NNLL         | NORTH OF NORTH LOT LINE           |
| SSLL         | SOUTH OF SOUTH LOT LINE           |
| EELL         | EAST OF EAST LOT LINE             |
| WWLL         | WEST OF WEST LOT LINE             |
| NNPL         | NORTH OF NORTH PROPERTY LINE      |
| SSPL         | SOUTH OF SOUTH PROPERTY LINE      |
| EEPL         | EAST OF EAST PROPERTY LINE        |
| WWPL         | WEST OF WEST PROPERTY LINE        |
| NSLL         | NORTH OF SOUTH LOT LINE           |
| SNLL         | SOUTH OF NORTH LOT LINE           |
| EWLL         | EAST OF WEST PROPERTY LINE        |
| WELL         | WEST OF EAST PROPERTY LINE        |
| NSPL         | NORTH OF SOUTH PROPERTY LINE      |
| SNPL         | SOUTH OF NORTH PROPERTY LINE      |
| EWPL         | EAST OF WEST PROPERTY LINE        |
| WEPL         | WEST OF EAST PROPERTY LINE        |
| NPL          | NORTH PROPERTY LINE               |
| SPL          | SOUTH PROPERTY LINE               |
| EPL          | EAST PROPERTY LINE                |
| WPL          | WEST PROPERTY LINE                |
| (N)(S)(E)(W) | LOOKING THIS PARTICULAR DIRECTION |
| (E)          | EXISTING                          |
| CL           | CENTERLINE                        |
| POLE LN      | CENTER OF POLE LINE               |
| D.I.         | DRAIN INLET                       |
| CB           | CATCH BASIN                       |
| OPRT         | OPEN RIGHT                        |
| CNR          | CORNER                            |
| SLD          | SEALED                            |
| CONSTR.      | CONSTRUCT                         |
| RECONSTR.    | RECONSTRUCT                       |
| F            | FLOW LINE                         |
| D.I.         | DRAIN INLET                       |

## SYMBOLS

|  |  |
|--|--|
|    | SANITARY SEWER MAIN & MANHOLE                                  |
|    | STORM SEWER MAIN & MANHOLE                                     |
|    | PRIVATE SEWER MAIN & MANHOLE                                   |
|    | COUNTY SEWER MAIN & MANHOLE                                    |
|    | FLUSHER OR CLEANOUT WITHOUT COVER                              |
|    | FLUSHER OR CLEANOUT WITH MANHOLE RING & COVER                  |
|    | SIZE OF MAIN & DIRECTION OF FLOW                               |
|    | CHANGE IN SIZE   |
|    | FORCE MAIN, SIZE AS SHOWN                                      |
|    | SUMP, NUMBER AS SHOWN  |
|    |  |
|    |  |
|    | MANHOLE & GUTTER DRAINS OR DROP INLETS                         |
|    |  |
|    |  |
|    | 'D' DENOTES DEPTH OF MANHOLE FROM RIM TO DEEPEST PIPE FLOWLINE |
|  | SEPERATION MANHOLE   |
|  |  |
|  | LOCATION NUMBER  |
|  | MAINTENANCE HOLE IDENTIFICATION NUMBER                         |
|  | PRIVATE STORM MAIN   |
|  | SUMMIT MANHOLE   |
|  | MAINTENANCE HOLE   |
|  | OUTFALL, FLAGGATE IF NOTED                                     |

## **APPENDIX B**

### List of Primary Streets

DWG. No. S-70 – Standard Manhole #3

DWG. S-80 – Standard Manhole No. 3A

DWG. S-130 – Inside/Outside Drop Connection

DWG. S-140 – Standard Manhole Head 1, Cover A

## PRIMARY STREETS

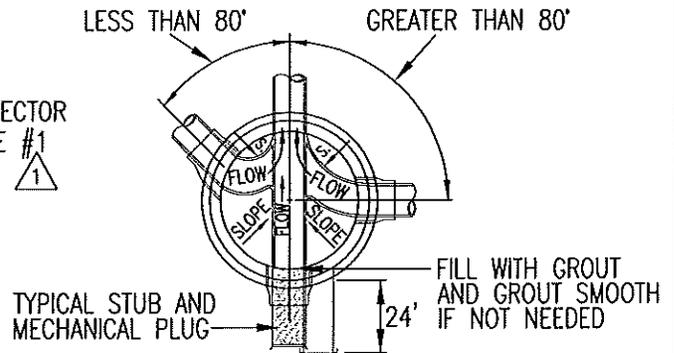
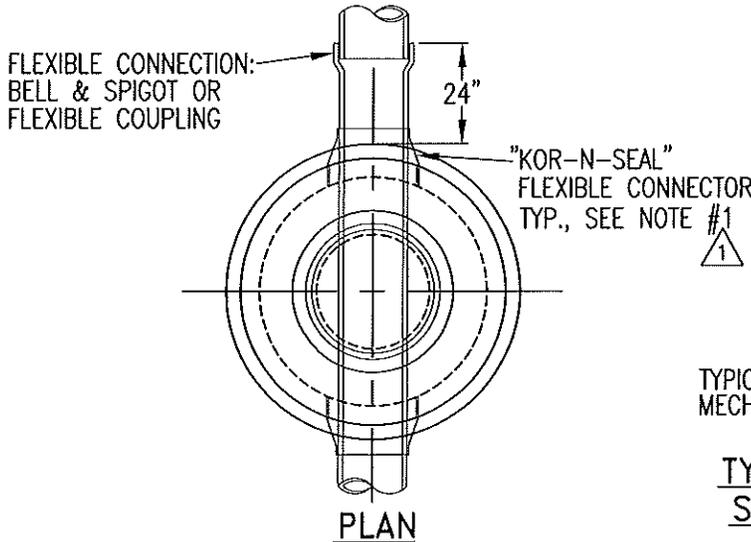
3<sup>rd</sup> Street between I St and Broadway  
5<sup>th</sup> Street between H St and Broadway  
6<sup>th</sup> Street between H St and Q St  
7<sup>th</sup> Street between G St and T St  
8<sup>th</sup> Street between G St and Broadway  
9<sup>th</sup> Street between G St and Broadway  
10<sup>th</sup> Street between G St and Broadway  
11<sup>th</sup> Street between G St and Q St  
12<sup>th</sup> Avenue between Martin Luther King, Jr. Bl and Sutterville Rd  
12<sup>th</sup> Street between N. 12<sup>th</sup> St and W St 13<sup>th</sup> Street between H St and L St  
14<sup>th</sup> Street between G St and L St  
15<sup>th</sup> Street between F St and Broadway  
16<sup>th</sup> Street between N. 16<sup>th</sup> St and Broadway  
19<sup>th</sup> Street between G St and Broadway  
21<sup>st</sup> Street between 4<sup>th</sup> Ave and G St  
24<sup>th</sup> Street, between (Knight Way and Meadowview Rd) and (W St and 2<sup>nd</sup> Ave)  
29<sup>th</sup> Street between D St and W St  
30<sup>th</sup> Street between E St and T St  
34<sup>th</sup> Street between Folsom Bl and Broadway  
43<sup>rd</sup> Avenue west of South Land Park Dr  
47<sup>th</sup> Avenue, City portions between 24<sup>th</sup> St and Stockton Bl  
55<sup>th</sup> Street  
59<sup>th</sup> Street between Folsom Bl and Broadway  
65<sup>th</sup> Street Expressway between Elvas Ave and south City boundary  
Alhambra Boulevard between E St and Broadway  
Alta Arden Expressway  
Alta Valley Way  
American River Drive between Howe Ave and Munroe St  
Arcade Boulevard between Marysville Bl and Marconi Ave  
Arden Way  
Azevedo Drive  
Broadway  
Bruceville Road  
Capitol Avenue between 15<sup>th</sup> St and Folsom Bl  
Carlson Drive  
Center Parkway  
Challenge Way  
College Town Drive

Connie Drive between Roseville Rd and Marconi Ave  
Cosumnes River Boulevard  
Del Paso Boulevard south of Marysville Bl  
E Street between 27<sup>th</sup> St and Alhambra Bl  
El Camino Avenue  
Elder Creek Road  
Elsie Avenue  
Elvas Avenue between 56<sup>th</sup> St and 65<sup>th</sup> St  
Ethan Way  
Evergreen Street  
Exposition Boulevard  
Fair Oaks Boulevard  
Florin Perkins Road  
Florin Road  
Folsom Boulevard  
Franklin Boulevard  
Freeport Boulevard  
Fruitridge Road  
G Street between 7<sup>th</sup> St and Alhambra Bl  
Garden Highway  
Greenhaven Drive  
H Street  
Heritage Lane  
Hornet Drive  
Howe Avenue  
I Street between 3<sup>rd</sup> St and 29<sup>th</sup> St  
J Street  
Jackson Road  
Jibboom Street  
K Street between 15<sup>th</sup> Street and Alhambra Bl  
L Street between 3<sup>rd</sup> St and Alhambra Bl  
La Mancha Way  
La Riviera Drive  
Land Park Drive  
Mack Road  
Main Avenue west of Kelton way  
Marconi Avenue  
Martin Luther King, Jr. Boulevard  
Marysville Boulevard between Del Paso Bl and Bell Ave  
Meadowview Road  
Munroe Street  
N Street between 2<sup>nd</sup> St and Alhambra Bl  
North 12<sup>th</sup> Street

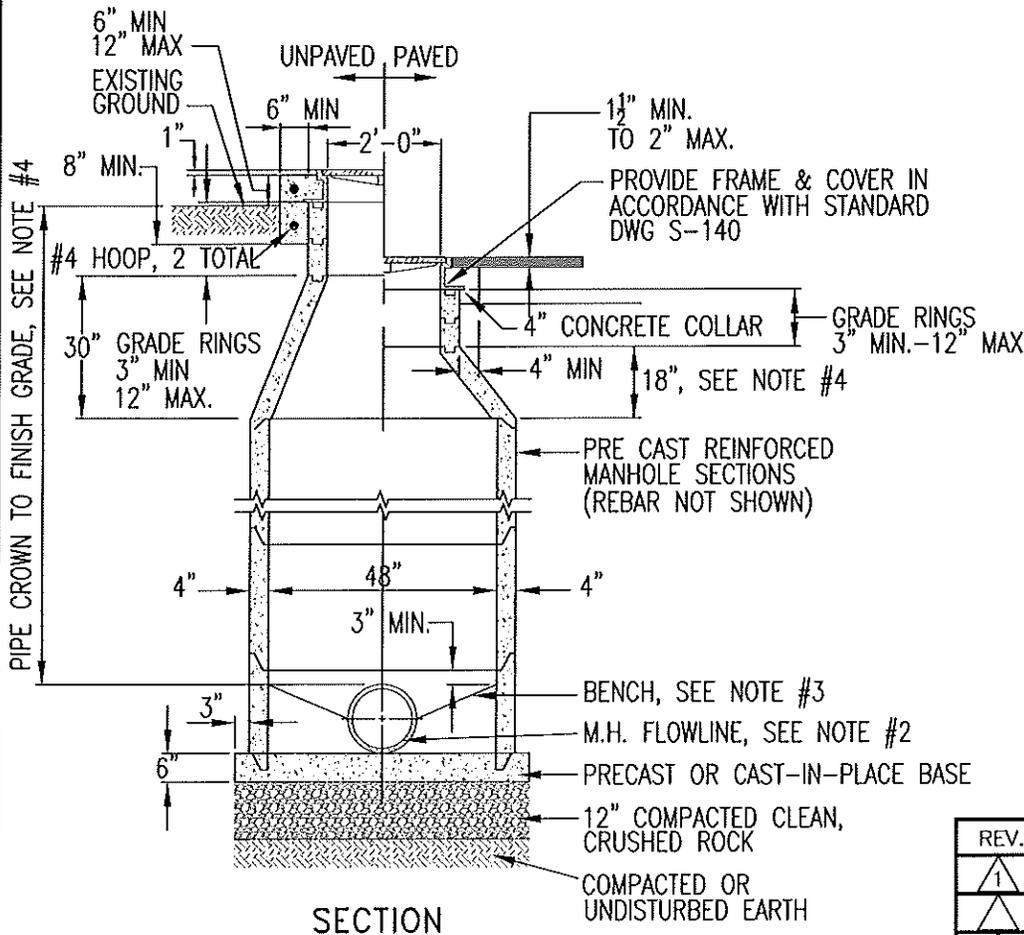
North 16<sup>th</sup> Street  
North B Street between N. 7<sup>th</sup> St and 16<sup>th</sup> St  
Northgate Boulevard  
Norwood Avenue  
P Street between 2<sup>nd</sup> St and Stockton Bl  
Pocket Road  
Point West Way  
Power Inn Road  
Q Street between 2<sup>nd</sup> St and Alhambra Bl  
Raley Boulevard  
Response Road  
Richards Boulevard  
Rio Linda Boulevard  
Riverside Boulevard  
Roseville Road  
Royal Oaks Drive  
San Juan Rd  
Seamas Avenue east of Riverside Bl  
South Land Park Drive  
South Watt Avenue  
Sproule Avenue  
Stockton Boulevard  
Sunbeam Avenue  
Sutterville Road  
T Street between 34<sup>th</sup> St and 39<sup>th</sup> St  
Truxel Road  
University Ave between Campus Commons Rd and Fair Oaks Bl  
Valley Hi Drive between Franklin Bl and Mack Rd  
W Street between 3<sup>rd</sup> St and 29<sup>th</sup> St  
West El Camino Avenue  
Windbridge Drive  
Winding Way  
X Street between 3<sup>rd</sup> St and Alhambra Bl

**NOTES:**

- MANHOLES SHALL CONFORM TO SECTION 25 OF THE STANDARD SPECIFICATIONS. ANY CONNECTIONS ABOVE MANHOLE BASE SHALL BE CORED AND INSTALLED WITH RESILIENT FLEXIBLE CONNECTION. AN ADDITIONAL FLEXIBLE CONNECTION SHALL BE PLACED 24" OUTSIDE BASE.
- FLOWLINE MATERIAL FOR MAIN PIPE AND INTERSECTING MAINS SHALL BE VITRIFIED CLAY EXCEPT: IF MANHOLE BASE IS PRECAST CONCRETE; OR MANHOLE BASE IS PLACED OVER MAIN WHICH IS "LAID THROUGH", IN WHICH CASE FLOWLINE MATERIAL SHALL BE SAME AS MAIN.
- MANHOLE BENCH SHALL SLOPE UPWARDS FROM THE SPRING-LINE OF THE PIPE TO THE PROJECTED LEVEL OF THE CROWN OF THE PIPE AT THE MANHOLE WALL OR 12" ABOVE THE SPRING-LINE, WHICHEVER IS LESS.
- IF PIPE CROWN TO FINISH GRADE IS BETWEEN 30" AND 39", USE A 18" CONE. IF LESS THAN 30", USE A FLAT SLAB TOP.



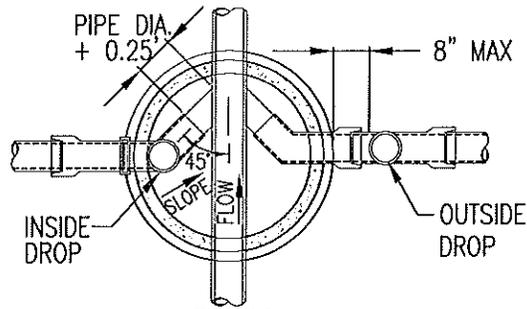
**TYPICAL PLAN VIEW OF MANHOLE  
SHOWING INTERSECTING SEWERS**



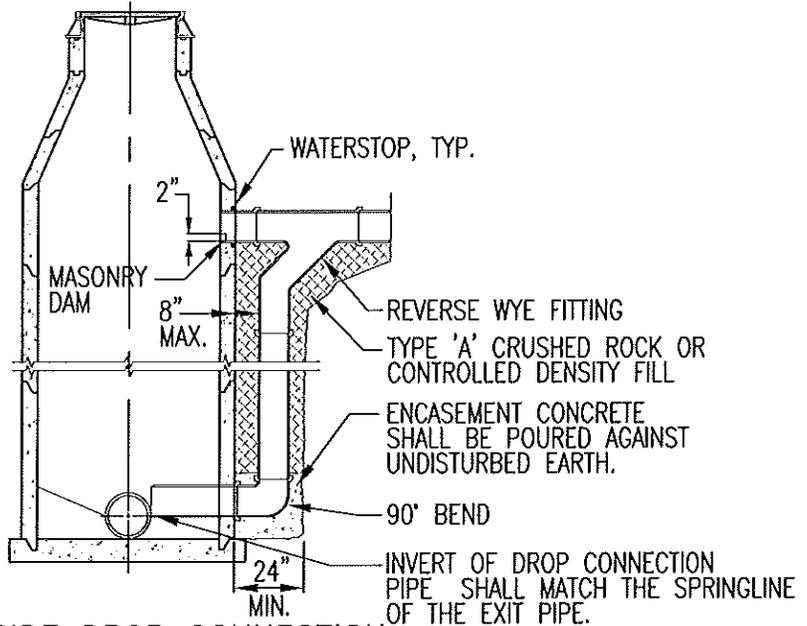
| REV. | DATE     | DESCRIPTION |
|------|----------|-------------|
| 1    | 03-23-09 | Noted       |
|      |          |             |
|      |          |             |

R:\Utilities\City\_Std\_Details\Sewer\_Drainage\S-70



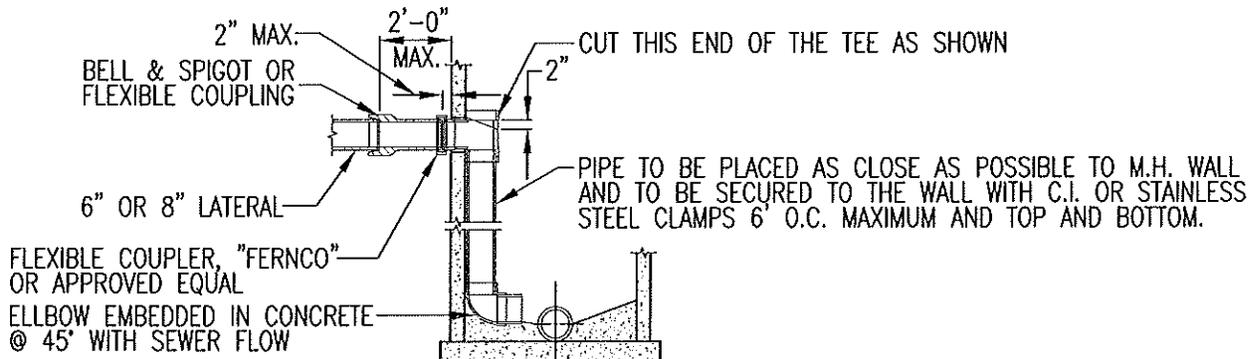


PLAN  
INSIDE & OUTSIDE DROP MANHOLE



OUTSIDE DROP CONNECTION

FOR 10" AND LARGER DROP OR WHERE SPECIFICALLY INDICATED ON THE DRAWINGS



INSIDE DROP CONNECTION

NOTES:

1. ALL INSIDE AND OUTSIDE DROP PIPING TO BE P.V.C. IN CONFORMANCE WITH ASTM D3034 (SDR 35).
2. ALL JOINTS SHALL BE SOLVENT WELDED.
3. DROP CONNECTION PIPE AND FITTINGS TO BE SAME SIZE AS LATERAL.
4. INSIDE DROP CONNECTIONS SHALL BE CORE-BORED. PROVIDE WATER-TIGHT CONNECTIONS WITH NON-SHRINK EPOXY GROUT AS DIRECTED BY ENGINEER.
5. PIPE JOINTS SHALL BE BELL & SPIGOT OR FLEXIBLE COUPLERS SUCH AS "FERNCO" OR APPROVED EQUAL.

| REV. | DATE     | DESCRIPTION |
|------|----------|-------------|
| 1    | 03-23-09 | Title       |
|      |          |             |
|      |          |             |

