

**CITY OF DANBURY**

**ENGINEERING DIVISION**

**CITY OF DANBURY PUBLIC WORKS DEPARTMENT**

**GENERAL INFORMATION & GUIDE**

**JANUARY 2010**

**(REVISED ON AN ONGOING BASIS)**

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**ENGINEERING DIVISION OF CITY OF DANBURY PUBLIC WORKS DEPARTMENT  
GENERAL INFORMATION**

**Information Available to Public:**

1. Sanitary Sewer Mains Mapping \*
2. Sanitary Sewer Mains Standards
3. Comprehensive Sewerage Study 1987
4. Water Mains Mapping \*
5. Water Main Standards \*\*
6. Comprehensive Water Distribution Study 1987
7. Pumping Station (Sewer and Water) Design Checklist
8. Road Standards (Ordinance and Subdivision Regulations-these standards are not the same)
9. Street Information (partial only)
10. Road "As Built" Mapping - (generally since 1965)
11. Storm Drainage (partial only) Mapping
12. Topographic Maps - 100 Scale (1997)
13. FEMA Flood Insurance and Floodway Mapping and Report
14. Current City Projects Plans and Specifications
15. DOT Project Plans (Danbury only)
16. Survey Data - Bench Marks, Monuments (partial only)

\* Limited information on individual services to properties is available.

\*\* Reference should be made to the Water Department Rules and Regulations on file in the Engineering and Public Utilities Divisions and found in Appendix E of this document.

**Permits Issued and Inspections made by Engineering Department:**

1. Water Connections - all new connections, additions to buildings, changes in use \*\*
2. Sewer Connections - all new connections, additions to buildings, changes in use
3. Connections Fees (Water and Sewer) are as set by Ordinance
4. Engineering Department inspects connections to water and sanitary sewers only.  
The remaining portions of services are inspected by the Building Department.

**Copying Costs:**

1. "Engineering Department General Information & Guide" - \$75.00 per copy

2. 8 $\frac{1}{2}$ " X 11", 8 $\frac{1}{2}$ " X 14", and 11" X 17" black line copies - \$0.50 per copy
3. All mapping/documents larger than 11" X 17" black line copies - \$10.00 per copy

Note: Maps will be ready on the business day following the day the order is placed. Copies of maps must be paid for in advance. A \$1.00 additional fee is charged to mail copies.

1/2010





# **CITY OF DANBURY**

155 DEER HILL AVENUE  
DANBURY, CONNECTICUT 06810

ENGINEERING DIVISION  
203 - 797-4641  
FAX 203 - 796-1586

FARID L. KHOURI, P.E.  
CITY ENGINEER

## **PERMITS ISSUED/APPROVED BY ENGINEERING DIVISION**

January, 2010

- Water connection permits: The division signs off on permits to be issued by Permit Center for new connections or for renovations of existing buildings. The division assigns a meter size, as well as permit fees in accordance with the Code of Ordinances. The meter size is provided to the Engineering Division by the Public Utilities Division. If the account for an existing water connection is in arrears, the Public Utilities Division will notify the Engineering Division that the permit cannot be issued. (See attached Permit Center Price List.)

- Sanitary sewer connection permits: The division signs off on permits to be issued by Permit Center for new connections or for renovations of existing buildings. The division assigns permit fees in accordance with the Code of Ordinances. If the account for an existing sanitary sewer connection is in arrears, the Public Utilities Division will notify the Engineering Division that the permit cannot be issued. (See attached Permit Center Price List.)

- Subdivision road construction permit: The Permit to Construct Roadways (subdivisions only) is issued by the Planning Commission. The Engineering Division signs off on each phase of construction, as it is completed and approved.

## **ENGINEERING DIVISION INSPECTION POLICY**

January, 2010

The Engineering Division inspects the following:

### **WATER**

- Water Main Installation and Testing
- Water Service Taps
- Water Service Installation to Curb Box

### **SANITARY SEWER**

- Sewer Main Installation and Testing
- Sewer Laterals from main to R.O.W. Line

### **NEW CITY ROADS**

- Road Subgrade
- Foundation Course
- City Drainage
- Pavement Binder Course
- Pavement Wearing Surface/Top Course
- Final Inspection for City Acceptance

- **Water connections:** The division inspects the water tap at the main and the water service installation within the roadway. Unless it is an emergency situation, 24 hours notice for a requested inspection is required.
- **Sanitary sewer connections:** The division inspects the connection to an existing lateral or the new tap on the sanitary sewer main, as well as the installation of the sanitary sewer pipe within the roadway. The plug at the end of an existing sewer lateral is only to be removed in the presence of the Engineering Division inspector. Unless it is an emergency situation, 24 hours notice for a requested inspection is required.
- **Subdivision roads:** The division inspects each phase of the road construction. Unless it is an emergency situation, 24 hours notice for a requested inspection is required.

Inspections are only to be booked through the Engineering Division office at 203 -797 - 4641. No cell phone or e-mail appointments will be accepted. Inspections are to be scheduled at least 48 hours before the start of construction. *Every attempt will be made to provide an inspector on the day and at the time requested. However, during busy times of the year, work may be required to be rescheduled, if Engineering Division staff is not available at the requested day or time.*

**The Engineering Division inspector is available for inspection from 8:30 a.m. to 4:00 p.m., Monday through Thursday, except when City Hall is closed for legal holidays or other reasons.**

At a pre-construction meeting, the contractor is to review the details of the project with the Engineering Division inspector prior to the start of construction and is to be familiar with City of Danbury standards, as found in the City of Danbury Engineering Division General Information Guide, available in the Engineering Division office.

Ongoing water and sewer main extensions will require daily scheduling. Twenty four (24) hours advance notice is required for all proposed work.

**Police officers are to be used as flagmen and arranged by contacting 203-797-4672 at the "Private Duty Desk". The Police Department will determine if a road can be shut down for the work.**

The following specific requirements (list is not meant to be all inclusive) are to be noted:

**Sanitary Sewer Service Connections:**

- The Engineering Division inspector will witness sanitary sewer connections that are cut into the main. The "coupons" for these new connections are to be saved. Connections to existing laterals will be witnessed to verify that the cap was removed, that the proper fitting was used to transition from sewer lateral to building sewer service and that unwanted sand and silt did not flow into the sanitary sewer.
- Contractor shall only remove the plug from the end of a sewer wye or lateral in the presence of and as directed by the Engineering Division inspector.

- The City Building Department is to be contacted to arrange for inspection of all work located on private property.

#### **Water Service Connections:**

- The Engineering Division inspector will witness water service taps and inspect the installation of the new water service from the main to the curb box for water tightness. The cut "coupon" is to be saved for all wet taps 3" or larger in size.
- Epoxy coated saddles are required for all size taps.
- Fire hydrant wet taps and installations are to be inspected.
- The City Building Department is to be contacted to arrange for inspection of all work located on private property.

#### **Sanitary Sewer and Water Main Installations:**

- Sanitary sewer main testing – sewer mains (with laterals already installed) are to be air tested in the presence of an Engineering Division representative. Sewer manholes are to be vacuum tested in the presence of an Engineering Division representative. Reference is made to additional specifications found in Appendix B of this guide.
- Water main and fire hydrant testing – chlorination, flushing and water pressure testing are to be scheduled to be performed in the presence of an Engineering Division representative. Reference is made to additional specifications found in Appendix D of this guide.
- Prior to the submittal of draft record drawings to the City, a binder paving course should be in place. A semi-final inspection will be conducted by the City Engineering and Public Utilities Divisions of the Public Works Department upon request by the contractor/developer and prior to the placement of the final pavement course. After the placement of the final pavement course and the adjustment of utility covers (manhole covers, water gate box covers, etc.), the Engineering and Public Utilities Divisions will schedule a FINAL inspection. Please refer to Appendix H for additional sanitary sewer and water record drawing requirements.

#### **City Road Construction**

- Prior to the start of any construction of the road, the Engineering Division is to visit the site with the contractor and conduct a pre-construction meeting. This is a mandatory meeting.
- The Engineering Division will inspect the roadway for sign-offs of the 5 phases (Stage 1: Excavation, Installation of Drainage within Right-of-Way, Rough Grading; Stage 2: Preparation of the Subgrade, Utility Lines Installed within Subgrade Area; Stage 3: Foundation Course; Stage 4: Complete Utility Installation within Highway Limits, Fine Grading, Binder First Course Paving; and Stage 5: Final Wearing Surface Placement, Curbing, Driveway Aprons, Shoulders and Side Slopes, Discharge Area, Riprap, Open Ditches, House and Foundation Drains, Easement, Right to Drain, Patching) of the

Planning Commission Permit to Construct Roadways. Reference is made to additional specifications found in Appendix F of this guide.



# CITY OF DANBURY

155 DEER HILL AVENUE  
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ENGINEERING DEPARTMENT  
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WILLIAM J. BUCKLEY, JR., P.E.  
DIRECTOR OF PUBLIC WORKS / CITY ENGINEER

## CITY OF DANBURY

### ENGINEERING DEPARTMENT INSPECTION POLICY

April 4, 2006

**The Engineering Department inspects the following:**

#### **WATER**

- Water Main Installation and Testing
- Water Service Taps
- Water Service Installation to Curb Box

#### **SANITARY SEWER**

- Sewer Main Installation and Testing
- Sewer Laterals from main to R.O.W. Line

#### **NEW CITY ROADS**

- Road Subgrade
- Foundation Course
- City Drainage
- Pavement Binder Course
- Pavement Wearing Surface/Top Course
- Final Inspection for City Acceptance

Inspections are only to be booked through the Engineering Department office at 797-4641. No cell phone or e-mail appointments will be accepted. Inspections are to be scheduled at least 48 hours before the start of construction. *Every attempt will be made to provide an inspector on the day and at the time requested. However, during busy times of the year, work may be required to be rescheduled, if Engineering Department staff is not available at the requested day or time.*

**The Engineering Department inspector is available for inspection from 8:30 a.m. to 4:00 p.m., Monday through Friday, except when City Hall is closed for legal holidays or other reasons.**

At a pre-construction meeting, the contractor is to review the details of the project with the Engineering Department inspector prior to the start of construction and is to be familiar with City of Danbury standards, as found in the City of Danbury Engineering Department General Information Guide, available in the Engineering Department office.

The Engineering Department inspector will witness water service taps and inspect the installation of the new water service from the main to the curb box for water tightness. The cut "coupon" is to be saved for all wet taps 3" or larger in size.

The Engineering Department inspector will witness sanitary sewer connections that are cut into the main. The "coupons" for these new connections are to be saved. New laterals are to be laid in

stone in accordance with City standards. Connections to existing laterals will be witnessed to verify that the cap was removed, that the proper fitting was used to transition from sewer lateral to building sewer service and that unwanted sand and silt did not flow into the sanitary sewer.

Ongoing water and sewer main extensions will require daily scheduling on the afternoon prior to the next day's work to verify with the inspector the work for that day and the expected time of the beginning of pipe laying.

The following specific requirements (list is not meant to be all inclusive) are to be noted:

**Sanitary Sewer Service Connections:**

- Contractor shall only remove the plug from the end of a sewer wye or lateral in the presence of and as directed by the Engineering Department inspector.
- The City Building Department is to be contacted to arrange for inspection of all work located on private property.

**Water Service Connections:**

- Epoxy coated saddles are required for all size taps.
- The City Building Department is to be contacted to arrange for inspection of all work located on private property.

**Sanitary Sewer and Water Main installations:**

- Sanitary sewer main testing – sewer mains (with laterals already installed) are to be air tested in the presence of an Engineering Department representative. Sewer manholes are to be vacuum tested in the presence of an Engineering Department representative.
- Water main testing – chlorination, flushing and water pressure testing are to be scheduled to be performed in the presence of an Engineering Department representative.
- Subsequent to the receipt of as-built drawings, a City field inspection of the water and/or sanitary sewer utilities will be scheduled by the Engineering Department, with the Public Utilities Department.
- The City will reinspect the utility installation after the second/final course of pavement has been placed and water gate boxes and manhole frames and covers have been adjusted to verify that no damage to these facilities has occurred. No extensions on water gate boxes or on sewer manhole frames are permitted.

- Hydrant installations will be inspected.

#### **City Road Construction**

- Prior to the rough grading of the road, the Engineering Department inspector is to visit the site with the contractor.
- The Engineering Department inspector will inspect the roadway for sign-offs of the 5 phases of the Planning Commission Permit to Construct Roadways.
- The wearing/final course of pavement and all curbing are required to have been installed before the road inspection by Highway and Engineering Department, when road acceptance by the City is requested.

**GENERAL GUIDE**

**ENGINEERING DIVISION FOR PLANNING REVIEWS**



**GENERAL GUIDE**  
**ENGINEERING DIVISION FOR PLANNING REVIEWS**

5/6/2014

This listing is meant to be used as a guide only. It is not all inclusive. All plans are to be designed following good and accepted engineering principles and practices. Additional comments or requirements may be made depending on the particular proposal being reviewed. Each item on this list may not apply to every plan submitted.

**A. SANITARY SEWER**

1. The engineer/designer is to make himself/herself knowledgeable as to the standards, codes, etc. of the City of Danbury.
2. Usage calculations are to be based on City criteria:
  - a. 100 gallons per capita per day (GPCD) or 90 GPCD with water saving devices
  - b. Number of Bedrooms                      Number of Persons
 

1	1.5
2	2.25
3	3.25
4	4.25
3. Connections are to be generally perpendicular to the building being served.
4. Generally, connections directly to manholes are not permitted.
5. Services are to meet the requirements of the plumbing code.
6. If the Engineering Division of the City of Danbury Public Works Department determines that an extension of a sanitary sewer main is warranted:
  - a. City Council approval is required. See Appendix A for the listing of typical conditions and restrictions attached to City Council approvals of petitions.
  - b. State of Connecticut Department of Environmental Protection (DEP) approval of plans is required for large sized mains (21" and larger) and for pumping stations. Submittal of plans to DEP must be made by the City after the Engineering and Public Utilities Divisions of the City of Danbury Public Works Department have approved the plans and under cover of a City letter of approval.
  - c. The extension is to be compatible with the current comprehensive sewer study of the City.
  - d. The size of the sanitary sewer main is to be based on full development of the sewershed (saturated per zoning) - minimum 8" pipe is required.
  - e. Sewer main extensions are to be designed by a State of Connecticut licensed professional engineer.
  - f. Materials and methods of construction are to be to City standards.

- g. All costs involved with the design, construction, record mapping, transfer of title/easements etc., of the sanitary sewer extension are to be borne by the party extending the sanitary sewer.
  - h. The City is to be provided adequate access to all future City manholes. In most cases this will mean that manholes are to be in pavement areas.
  - i. The contractor is to meet with a City inspector prior to the start of construction to review plans as well as City standards for materials (shop drawings) and methods of construction. See Appendix B for City of Danbury standards for pipe, manholes, testing, etc.
- 7. Septic systems are to be abandoned as per City of Danbury Health Department requirements.
- 8. Existing sanitary sewer services which will not be used are to be abandoned in manners acceptable to the Public Utilities Division of the City of Danbury Public Works Department.
- 9. If it is proposed to use an existing service, the engineer or plumber is to verify the adequacy of the size and condition of the existing service for the proposed use.
- 10. A road opening permit for work within a City road right of way is to be acquired from the City Permit Center in City Hall.
- 11. State of Connecticut Department of Transportation approval of work within a State road right of way will be required.
- 12. Title to pipe and appurtenances (the City will not own or be responsible for private sewer services/individual laterals), as well as any easements required for the portions of the sewer which will become the City's (the City will own all portions of the sanitary sewer extension that serve at least two individual buildings) are to be granted as warranted. All legal documents are to be in forms acceptable to the City Corporation Counsel.
- 13. No private pumping stations serving more than one building are permitted.
- 14. For municipal pumping station design see Appendix C for the design checklist.
- 15. For some industrial and commercial uses, the City of Danbury Public Works Department may ask for information on the characteristics of the wastewater to be discharged. All wastes must comply with local ordinances and with State of Connecticut DEP requirements. An industrial discharge requires a permit from the State DEP.
- 16. Facilities that may produce a fats, oil or grease (FOG) discharge must meet requirements of the CT DEP FOG Permit. An outdoor grease trap is required. The Public Utilities Division of the City of Danbury Public Works Department is to be contacted.
- 17. All sewage discharges must be consistent with the City's current NPDES permit. For information concerning the permit's discharge requirements as to quality and quantity of a discharge, contact the Public Utilities Division of the City of Danbury Public Works Department.

18. Since State of Connecticut and Federal site plans and building plans are exempt from review, approval and permitting by the City Planning Commission/Department, City Building Department, and other City agencies, the Engineering Division's only opportunity to request sanitary sewer information relative to a proposed building/development is during the connection permit process.

Before a sanitary sewer connection permit is approved/issued, the Engineering Division is to require a letter from a State of Connecticut licensed professional engineer stating that the additional sanitary sewage flow from the proposed development can be adequately handled by an on-site sanitary sewer service (if one exists) and by the City sanitary sewer main into which the sewage flow will discharge. In the cases of State of Connecticut and Federal developments only, the City will permit more than one building to connect to a sanitary sewer service. The City will not own and maintain any of the sanitary sewer service(s) on State of Connecticut or Federal property.

Connection fees are to be collected and connection permits issued for sanitary sewer to a new building or to an addition to an existing building for State of Connecticut and Federal buildings (for examples: Western Connecticut State University, Armed Forces Reserve Center, Federal Correctional Institution, etc.). Sanitary sewer connection fees will be computed as per City Ordinance 16-4.

## B. WATER

1. The engineer/designer is to make himself/herself knowledgeable as to the standards, codes, rules and regulations of the City of Danbury. Reference is made to Appendix E of this guide for additional information.
2. For most projects a "Needed Fire Flow" analysis based on the appropriate criteria (Insurance Services Office (ISO) for non-sprinklered buildings or NFPA for sprinklered buildings) is required.
3. The Public Utilities Division of the City of Danbury Public Works Department is to be contacted by the developer/engineer to acquire flow and pressure information for the City water system in the area of the project in order to verify that it is adequate to meet the "Needed Fire Flow" as calculated. This information is to be submitted to the Engineering Division of the City of Danbury Public Works Department.
4. Connections are to be generally perpendicular to the building being served.
5. A road opening/highway permit from the City Permit Center will be required for any work within a City road right of way.
6. State of Connecticut Department of Transportation approval of any work proposed within a State road right of way will be required.
7. Only one domestic service connection and one domestic water meter per building will be permitted. Service connections shall be installed with a shutoff valve and a curb box.
8. A fire service to a building can be made either via a separate tap (the domestic connection also being a separate tap) on the City water main or by combining the domestic and fire service and making one tap on the water main.

If separate services are to be run from the water main to the building served, the taps are to be made a minimum of two feet apart. The exact separation distance between taps will be determined in the field by the City's inspector based on actual conditions.

If a single combined fire/domestic service tap is made, the fire service and the domestic service are to separate a minimum 5 feet outside the face of the building.

Tapping sleeves are to be to City standards.

All ductile iron fire lines (fire only or combined fire and domestic) are to be flushed, disinfected and sampled. Samples must pass water quality testing prior to the pressure test.

The City of Danbury Building Department is responsible for the inspection of the fire line installation from the edge of the City road to the building.

A fire line requires a double check valve assembly or reduced pressure device (RPD) and a fire detection check meter.

9. A Siamese connection requires a reduced pressure device (RPD) and a fire detector check meter.
10. An irrigation water line requires a reduced pressure device (RPD).
11. A domestic water line requires a reduced pressure device (RPD)
12. A boiler requires an appropriate backflow prevention device.
13. Saddles are required for all size water connections.
14. No plastic service lines are allowed by the City between the City main and the building to be connected.
15. Services are to meet the requirements of the plumbing code and the Water Department Rules and Regulations. Reference is made to Appendix E of this guide for additional information.
16. The State of Connecticut Health Code (Section 19-13-B51m) states that a well permit cannot be issued by the Director of Health, if the City water system is within two hundred (200') feet (measured along a street, alley or easement) of the boundary of the parcel of property to be served.
17. State of Connecticut Department of Public Health (DPH) approval is required for water pumping stations, storage tanks and water lines 8 inches in diameter or larger, prior to the City issuing a water line connection permit.
18. If the Engineering Division of the City of Danbury Public Works Department determines that a water main extension is warranted:
  - a. City Council approval will be required. See Appendix A for the listing of typical conditions and restrictions attached to City Council approvals of petitions.
  - b. The extension is to be compatible with the current comprehensive water study for the City.

- c. The size of the water main is to be based on the full development needs of the service area and is to meet the peak flows expected - a minimum 8" pipe size will be required.
- d. Water mains shall have a minimum water pressure of 35 psi under normal operating conditions. Pressure reducing devices shall be provided in areas where static pressure will exceed 125 psi.
- e. Dead end water mains shall be avoided whenever possible. Where dead-end mains are installed, adequately sized blowoffs or flushing hydrants shall be installed.
- f. Materials and methods of construction are to be to City standards. Pipe, fittings, valves and fire hydrants shall, at a minimum, conform to the latest standards established by AWWA. See Appendix D for City standards for pipe, fire hydrants, valves, testing, etc.
- g. The materials shall not cause the water delivered to customers to become impure, unhealthful and non-potable, after being placed into active service. Paints, linings, coatings, adhesives, and lubricants in contact with potable water shall be ANSI certified. All materials shall be kept as clean as possible during construction.
- h. Materials shall be capable of withstanding internal and external forces to which they may be subjected, while in service and shall be protected against internal and external corrosion.
- i. All costs involved in the design, construction, record mapping, transfer of title and easements, etc. are to be borne by the petitioner/party extending the water main.
- j. Water mains and related facilities are to be designed by State of Connecticut licensed professional engineers.
- k. A water main is to have 4.5 feet of cover to prevent freezing, unless approved otherwise by the Engineering Division of the City of Danbury Public Works Department.
- l. Fire hydrants are to be installed in locations which provide a maximum spacing of 500 feet, at the ends of dead ended mains (for flushing purposes), at high points in the main and elsewhere, if required. The maximum length (connection at water main to fire hydrant body) of a fire hydrant service is to be fifty (50'), however, consideration and possible approval of a deviation from this requirement will be given by the City Engineer on a case by case basis.
- m. At high points in water mains where air can accumulate, if a fire hydrant is not installed, provisions are to be made to remove air by air-relief valves.
- n. In most cases, the Engineering Division of the City of Danbury Public Works Department, will require that restrained joint pipe be installed in a roadway, where it is likely that other utilities exist or may be installed. Restrained joints are to be used at all tees, bends, caps, plugs, valves, and fire hydrants to prevent movement. A proposed use of thrust blocks will be reviewed and

approved or not approved by the Engineering Division on a case by case basis.

- o. At the discretion of the Engineering Division of the City of Danbury Public Works Department, valves may be required to be installed on all three legs of a tee and/or elsewhere.
  - p. The maximum deflection allowed at a joint is 80% of the manufacturer's recommended maximum joint deflection.
  - q. Water mains shall be laid at least 10 feet horizontally from any existing or proposed gravity sanitary sewer, when possible. Where 10 feet of separating distance cannot be physically achieved, the water main is to be located at least 18 inches above the sanitary sewer. No water pipe is to come in contact with any part of a sanitary sewer or storm manhole.
  - r. At sanitary sewer and storm sewer crossings, a minimum vertical clearance of 18 inches, measured from crown to invert, shall be maintained between the water main and the sewer. Water main joints are to be spaced as far as possible from the sewer crossing.
  - s. For bridge crossings, the water pipe shall be adequately supported, protected from damage and insulated from freezing.
  - t. The City is to be provided adequate access to the main and its appurtenances. In most cases the main will be required to be installed in pavement areas.
  - u. The contractor is to meet with a City inspector prior to the start of construction to review plans and City standards for materials (shop drawings) and methods of construction.
  - v. Reference is made to the Water Department Rules and Regulations in Appendix E of this guide for additional information.
19. No physical connection shall be made between the distribution system of a public water system and any customer with a private well, unless the well is physically disconnected. Wells are to be abandoned in manners acceptable to the City Health Department.
  20. If an existing service is to be reused and Public Utilities Division of the City of Danbury Public Works Department approval has been obtained, the engineer or plumber is to verify that the size and condition of the service are adequate for the proposed use.
  21. An existing service which is to be discontinued is to be abandoned in a manner acceptable to the Public Utilities Division of the City of Danbury public Works Department.
  22. Title to pipe and appurtenances (the City will not own or maintain private services), as well as easements for the portions of the system which will become the City's (the City will own to a convenient point beyond where at least two buildings are served), are to be granted to the City, where warranted. Legal documents are to be in forms acceptable to the Corporation Counsel's Office.
  23. No private pumping station serving more than one building is permitted.
  24. For municipal pumping station design see Appendix C of this guide for a design checklist.

25. Private fire hydrants are not allowed.
26. The City Fire Department should review the plans with respect to access and fire protection in general.
27. Plumbing for domestic irrigation systems is to occur on the residence side of the water meter. The type of domestic irrigation system to be installed is to be noted on the water connection application submitted to the City Permit Center.
28. Since State of Connecticut and Federal site plans and building plans are exempt from review, approval and permitting by the City Planning Commission/Department, City Building Department, and other City agencies, the Engineering Division's only opportunity to request water information relative to a proposed building/development is during the connection permit process.

Before a water connection permit is approved/issued, the Engineering Division is to require a letter from a State of Connecticut licensed professional engineer stating that the water service (if one exists) can adequately handle the proposed additional water demand of the development. The professional engineer is to certify that sufficient water can be delivered from the City water main to all existing and proposed buildings to meet quantity and pressure requirements. The professional engineer is also to certify that sufficient water can be delivered to the development from the existing City water system to meet fire service/fire protection requirements. In the cases of State of Connecticut and Federal developments only, the City will permit more than one building to connect to a water service. The City will not own and maintain any of the water service(s) on State of Connecticut or Federal property.

Connection fees are to be collected and connection permits issued for water services to a new building or to an addition to an existing building for State of Connecticut and Federal buildings (for examples: Western Connecticut State University, Armed Forces Reserve Center, Federal Correctional Institution, etc.). Water service connection fees will be computed as per City ordinance 21-48.

### C. STORM DRAINAGE

1. Pre-development and post-development runoff computations for the entire site based on a 25 year storm will be required. Where open channels, culverts and/or bridges are proposed or where open channels, culverts and bridges may be impacted by site improvements/development, the Engineering Division may require that these hydraulic facilities/structures be analyzed for 50, 100 and/or 500 year storm frequencies.
2. Calculations for sizing the on and off site drainage systems (based on a 25 year storm) will be required.
3. Either the Rational, TR-55 or TR-20 (where applicable) method is acceptable.
4. Rights to drain from downstream property owner(s) will be required, if there is an increase in the rate of or volume of runoff discharged from the site, a change in the point of discharge of runoff from the site in question onto other property or if there is a decrease in runoff which has adverse affects downstream.
5. The developer's engineer is to verify that surface runoff from any City road will not have a negative impact on the site. If runoff from a City road will impact the site, a drainage

plan to handle this runoff is to be developed by the engineer for installation by the developer.

6. Connections to existing systems:

- a. Calculations on the adequacy of the capacity of the existing downstream system will be required. If portions of the existing system are found to be inadequate, replacement of these portions of the existing system may be necessary.
- b. If connecting to a City system, the connection is to be made under the supervision of and to the satisfaction of the City's Highway Department.

7. Retention Systems/Detention Systems/Drywells where proposed:

- a. Calculations (based on a 25 year storm) for the sizing of the storage required for the proposed development and of the outlet control are required.
- b. Percolation and deep hole tests are to be done and results submitted, if warranted.
- c. The installation of the system is to be done under the supervision of A State of Connecticut licensed engineer.
- d. After construction, the engineer who supervised the installation of the system is to submit to the City written certification that the system was installed as per the approved design.
- e. A reminder to the property owner that the system will remain a private one and that regular maintenance will be crucial to its continued functioning as intended is to be made.
- f. Adequate access to the system for maintenance purposes is to be provided.
- g. If the system is to be installed in a parking/driveway area, it is to be capable of handling minimum H-20 loads.
- h. A DEP dam permit may be warranted for a detention or retention pond.

8. Floodplains and floodways are to be shown where denoted by the Federal Emergency Management Agency (FEMA). No filling in a floodway will be allowed.

9. Army Corps of Engineers approval is to be acquired, if warranted.

10. Discharges are to be properly stabilized.

11. Roof drains are to be shown on the plan.

12. It is recommended that no portion (other than floor drains or underdrains) of a private on-site storm drainage system be located beneath a building or structure.

13. If the development will discharge to a State of Connecticut storm drainage system, State Department of Transportation (DOT) approval will be required.



14. Extensions of systems in City roads:
  - a. Pipe is to be a minimum 15 inches in diameter.
  - b. Reinforced concrete pipe (RCP), asphalt coated corrugated metal pipe (ACCMF) , aluminized steel corrugated metal type 2 pipe, or ADS -N12 smooth wall polyethylene corrugated drain pipe meeting City specifications is to be used. Reference is made to Appendix G of this guide.
  - c. Curb inlet type catch basins are to be installed wherever possible.
  - d. DOT standards are generally followed by the City.
15. A road opening/highway permit from the City Permit Center in City Hall will be required for any work within a City road right of way.
16. State of Connecticut Department of Transportation approval will be required for any work within a State road right of way.
17. Since State of Connecticut and Federal Government site plans and building plans (for examples: Western Connecticut State University, Armed Forces Reserve Center, Federal Correctional Institution, etc.) are exempt from review, approval and permitting by the City Planning Commission/Department, City Building Department, and other City agencies, the Engineering Division's only opportunity to review storm drainage information relative to a proposed building/development is during the sanitary sewer service and water service connection permit process.

Before water and/or sanitary sewer connection permits are approved/issued, the Engineering Division is to require a letter from a State of Connecticut licensed professional engineer stating that there will be no negative impact on downstream properties and/or on the downstream stormwater system, as a result of the proposed State of Connecticut or Federal development. If analysis of the downstream impact of the proposed development is not performed and warranted improvements to the downstream storm drainage system are not made, the developer (State of Connecticut or Federal Government) is to maintain pre-development flows from the site.

If the proposed State of Connecticut or Federal Government development will connect to or discharge to the storm drainage system within a State roadway, State of Connecticut Department of Transportation approval will be warranted.

#### D. GRADING

1. Existing and proposed contours as well as an adequate number of spot elevations are to be provided. Contours at two foot intervals are recommended.
2. Construction and/or grading rights from adjacent property owners are to be acquired if warranted.
3. Retaining walls over three feet in height are to be designed by and constructed under the supervision of a State of Connecticut licensed professional engineer or architect. If an existing retaining wall on the site is to remain, the State of Connecticut licenses professional engineer or architect is to analyze the wall to verify that it is in a condition suitable for the proposed use of the site.

4. No wood retaining walls over three feet in height will be permitted.
5. Adequate compaction of fill is to be provided.
6. Where ledge is to be left, the stability of the ledge is to be verified by a qualified State of Connecticut licensed professional engineer or soils scientist.
7. A grading permit from the City Health Department is to be acquired if warranted.

#### E. PARKING, DRIVEWAYS, SIDEWALKS

1. Parking for the handicapped is to be provided as warranted.
2. Driveway ramps are to be to City standards. For additional details and specifications, reference is made to Appendix F of this guide.
3. Driveway widths at gutter lines are to be reasonable and acceptable to the City Highway Department.
4. A driveway is not to extend in front of adjacent property.
5. A sidewalk (5 feet in width and concrete) is to be installed across the front of the property at or near the property line. The sidewalk grade is to be carried across the driveway. Ramps for the handicapped are to be provided as per State of Connecticut regulations. For additional details and specifications, reference is made to Appendix F of this guide.
6. If the driveway is connecting to a State of Connecticut roadway, a DOT permit is needed. The City will recommend to the State that on all State roads concrete driveway aprons, concrete curb and concrete sidewalks be required.
7. Verifications of adequacies of proposed sight distances and stopping distances at driveways and/or intersections are to be provided. Sight distances and stopping distances provided are to meet AASHTO standards.
8. Existing driveways no longer to be used are to be closed in manners acceptable to the City or State Highway Departments (whichever is appropriate).
9. Driveways which are less than 100 feet from an intersection of two or more roads are to be reviewed by the City Traffic Engineer and reviewed and approved by the Local Traffic Authority (Police Chief) and the Superintendent of Highways.

#### F. RECYCLING

1. The City of Danbury , in accordance with the Recycling Ordinance (Sec.16A-80 of the Code of Ordinances), requires recycling of the following:

newspaper  
glass food containers  
metal food containers  
plastic food containers  
cardboard

leaves  
waste oil  
storage batteries  
office paper  
scrap metal

2. If the structure is to hold a residency, it should be treated as a private residency, and the recycling should be an extension of the garbage contract for the residency. All mandated items must be recycled.
3. If the structure is to hold a daily or weekly school, a collection container for white office paper must be placed outside the building. It is suggested that a smaller container be placed within each classroom.
4. A collection container must be placed in the office for white office paper.
5. If the structure holds a kitchen to be used by groups or outside groups, those responsible must be notified of recycling regulations. It is suggested that they be required to remove all rubbish and recyclables with them from the premises.
6. Leaves must not be included in the solid waste stream.

#### G. ROADS

1. Roads are to meet the requirements of the Subdivision Regulations or the road ordinance, where applicable.
2. Any work affecting existing trees within a City road right of way or on City property is to be approved by the City Tree Supervisor.

#### H. BRIDGES (PRIVATE)

1. Where a private bridge is included as part of the access driveway system, such bridge shall be designed to ensure it provides adequate and safe access that will not jeopardize public health, safety or welfare. Construction of said bridge, including its components and support systems, requires both a Zoning Permit and Bridge Permit from the City of Danbury. The bridge, including its components and support systems, must be installed under the direction of a professional engineer licensed by the State of Connecticut and hired by the applicant after approval by the Department of Planning and Zoning or its designee, which such approval shall not be unreasonably withheld. Said professional engineer shall possess experience in bridge design and both structural and geotechnical engineering disciplines, as necessary. The City may also choose to conduct inspections during the installation and construction process. Prior to issuance of a certificate of compliance by the Zoning Enforcement Officer, as specified in these Regulations, the applicant's professional engineer must provide a sealed certification that the bridge system was installed in accordance with the design approved with the site plan and is in good working condition.
2. Privately owned bridges are to be designed to meet H-20 loading requirements and to pass a 100 year flood.
3. Privately owned timber bridges are to be designed to meet H-20 loading requirements and to pass a 100 year flood. Designs, as per Federal Highway Administration (FHWA) requirements, are to utilize the Load and Resistance Factor Design (LRFD) design

specifications published by the American Association of State Transportation and Highway Officials (AASHTO).

I. SIGNS (other than street signs and traffic control signs approved by the City Traffic Authority)

1. The following factors will be taken into account, when a request for the installation of a sign within the road right of way is submitted:
  - a. the impact of the sign on the installation and maintenance of street appurtenances (gas lines, telephone lines, water lines, sanitary sewer lines, storm drainage, etc.)
  - b. provision of an adequate snow shelf for snow storage
  - c. provision of adequate safe sight distances and stopping sight distances
  - d. future roadway reconstruction activities
  - e. provision of adequate recovery area for vehicles that drift off the edge of the travel way to allow them to stop safely or to steer back onto the roadway. Any fixed objects placed in roadway shoulders within close proximity of travel way are considered roadside hazards. They may have a major negative effect on the severity of vehicle accidents.
  - f. installation of fixed objects within roadway shoulders and within close proximity of the travel way expose both the property and sign owners to potential legal liabilities
2. City regulations generally prohibit the placement of signs or any physical objects within a City right of way, unless the installation is approved by the City Council. Based on roadway characteristics and traffic conditions in the area, installation of such signs could be considered for approval by the City Council, if the following eight conditions are satisfied:
  - a. installation will be under a license that requires the removal of the sign with short notice upon request by the City
  - b. placement at least ten (10) feet from the edge of the travel way
  - c. use of breakable materials as per AASHTO standards
  - d. height of sign is to be limited to thirty (30) inches
  - e. sign is to be able to withstand 90 MPH wind
  - f. the proposed location is to be reviewed and approved by the Engineer and Highway Divisions of the City Public Works Department
  - g. the design layout and structure of the sign are to be reviewed and approved by the City Planning and Zoning Department
  - h. and agreement satisfactory to the City Corporation Counsel that includes provisions to hold the City harmless with respect to damage or injury to persons or property is to be entered into by the City and the sign/property owner

J. TRAFFIC IMPACT STUDY

## 1. General

- a. This is a guide meant to provide guidance to developers, traffic engineers and planners on contents of traffic impact studies submitted in conjunction with development applications to the City of Danbury.
- b. This guide is in the form of a checklist for a generally accepted analysis procedure. It is not a comprehensive listing for every method or procedure that may be used in preparation of a traffic impact study. Also, it does not cover special types of development that may require different procedures for analysis. Professional judgment and creativity in performing traffic impact studies is, therefore, encouraged.
- c. The overall objective of a traffic impact study is the identification of all existing and expected future traffic bottlenecks within the impact area and determination of all appropriate traffic improvement measures that need to be considered. Major consideration should be given to safeguarding public safety, welfare, convenience and other general interests.
- d. It is expected that the use of this checklist will have substantial efficiency benefit in the preparation and review of studies. Furthermore, consistency among various studies will be maintained.
- e. Information provided through the use of this document is meant to supplement information required by State or other City jurisdictional review agencies. It is encouraged that requirements of such agencies also be submitted.
- f. The submitted traffic information and plans will be considered public information by the City of Danbury. The City is, therefore, free to use or share the information with other public or private agencies.

## 2. Checklist for Conducting Traffic Impact Study

### a. Inventory of Existing and Proposed Land Use

#### i. Existing Land Use

- Location of lot
- Size of lot
- Zoning of lot
- Type of land use

#### ii. Proposed Land Use

- Zoning
- Type of land use
- Potential buildable units or square footage

### b. Inventory of Adjacent Land Use

#### i. Zoning

#### ii. Types of land use

#### iii. Approved and planned developments in area

#### iv. Developments recently completed and those under construction

### c. Inventory of Existing Roadway and Traffic Conditions within Area

- i. Street network and classification
- ii. Street width, right of way and number of lanes
- iii. Geometrics and characteristics of streets including roadway alignment and intersection geometric features
- iv. Types and locations of traffic control devices within the impact area
- v. Operational features of traffic control devices
- vi. Up to date 24 hour weekday directional traffic counts
- vii. Up to date AM and PM peak period turning volume counts at intersections and other critical locations.
- viii. Analysis of 3 year accident history by frequency, type, cause, number of injuries, etc. (Accident collision diagram should be provided.)
- ix. Transit routes, headways and locations of stops or terminals within the area

d. Projection of Street Traffic Condition Within the Area (Without Traffic Improvement)

- i. Determine traffic specific to planned, approved, under construction and just completed developments in area
- ii. Combine background traffic with traffic specific to developments in area
- iii. Project street traffic volumes (two and five years from present) using an annual growth factor of 5 percent or a growth factor based on historical traffic data for the area, whichever is higher

e. Projection of Site Traffic

- i. Estimate trip generation rate per unit or square footage
- ii. Calculate AM, PM, and all day traffic to be generated
- iii. Estimate trip distribution in percentage (assume the worst case scenario)
- iv. Assign trips to street network within the impact area

f. Analysis of Traffic Conditions

- i. Combine projected site and street traffic (two and five years from present)
- ii. Analyze and identify all expected traffic and roadway conditions (without traffic improvements)
- iii. Develop possible remedies to existing and expected traffic bottlenecks (conceptual design plans should be submitted)
- iv. Re-analyze traffic and roadway conditions (with traffic improvements)

g. Site Access Points

- i. Identify proposed driveway locations
- ii. Indicate roadways and other features including driveways, traffic control devices, on street parking, poles, trees, etc. existing within driveway sight distance requirements on both sides of the road
- iii. Indicate proposed driveway dimensions: grade, radii, width, separation distance, vehicle storage or queue length, height clearance, etc.
- iv. Indicate existing and proposed driveway sight distances and location and height of proposed features within sightline triangles

- v. Indicate proposed driveway control devices, channelization and pavement markings
- vi. Indicate proposed on-site parking spaces adjacent to driveway
- vii. Indicate proposed on-site circulation of vehicles insuring no backing maneuvers into and out of driveway
- viii. Indicate proposed location of street right of way, curbing, sidewalk, etc.
- ix. Provide LOS analysis for each access point ( two and five years from present )

APPENDIX A

CONDITIONS AND RESTRICTIONS

TYPICAL SANITARY SEWER AND WATER EXTENSIONS

COMMON COUNCIL



APPENDIX A

**CONDITIONS AND RESTRICTIONS  
TYPICAL SANITARY SEWER AND WATER EXTENSIONS  
CITY COUNCIL  
CITY OF DANBURY**

1. The petitioner shall bear all costs relative to the installation of said sanitary sewer/water extension.
2. The petitioner shall submit as-built drawings of this extension prepared by a licensed Connecticut Land Surveyor for approval by the City Engineer.
3. Detailed engineering plans and specifications are to be approved by the City Engineer and the Superintendent of Public Utilities prior to the start of construction.
4. If required, a warranty deed in a form satisfactory to the Corporation Counsel shall be executed by the petitioner conveying to the City all right, title, interest and privileges required hereunder and said deed shall be held in escrow for recording upon completion of installation.
5. That upon completion of installation, title to said sewer/water line within City streets and any necessary documents be granted to the City in a form which is acceptable to the City Engineer and Corporation Counsel.
6. The petitioner shall convey ownership of any easements to all or such portions of the sanitary sewer/water lines as the City Engineer's Office determines are of potential benefit to other landowners in the City.
7. No Certificate of Occupancy shall be issued until the above requested forms, documents, plans, etc. are received and the City owns the extended sanitary sewer/water lines.
8. **This approval shall expire eighteen (18) months following the date of the City Council action. The City Council may, at its option, renew this approval for another eighteen months period. A letter to the City Council requesting a time extension is warranted.**

APPENDIX B

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CITY OF DANBURY  
SANITARY SEWER  
SPECIFICATIONS AND DETAILS

SPECIFICATIONS

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**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
SANITARY SEWER PIPE**

June 1, 1988  
Revised November 10, 1994  
Revised September 28, 1995  
Revised February 1, 2007  
Revised January, 2010

**GENERAL.** All pertinent State and Federal requirements/regulations relating to excavations and construction in general (including but not limited to OSHA and "Call Before You Dig" ) are to be complied with at all times.

**CAST IRON SEWER.** Cast iron pipe shall be Extra-Heavy Weight cast iron or ductile iron pipe and be joined by self-entering push type flexible compression joints.

Cast iron pipe shall conform to ANSI Standard A21.51 and shall be installed in accordance with the recommended practice for installing cast ductile iron pipe and the manufacturer's recommendation.

Cast iron fittings shall be Pressure Rating Class 250 Gray Iron conforming to ANSI Standard A21.10.

Joints for cast iron pipe and fittings shall conform to ANSI Standard A21.11.

Cast iron sewers shall be furnished with cement mortar lining and bituminous outside and inside coatings. The cement mortar lining shall conform to ANSI Standard A21.4 and the bituminous coatings shall conform to ANSI Standard 21.51.

**PVC SEWER.** Polyvinyl chloride pipe and fittings shall meet the requirements of ASTM Specification D3034 for SDR35 (4" to 15"), ASTM F679 (18" to 27") and ASTM Specification D2241 for SDR-21. The pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber ring.

All fittings and accessories shall be as manufactured and furnished by the pipe supplier or approved equals.

Minimum "pipe stiffness" at 5% deflection shall be 46 psi for all sizes when tested in accordance with ASTM Method of Test D2412. "External Loading Properties of Plastic Pipe by Parallel-Plate Loading."

Two sections of pipe shall be assembled in accordance with the manufacturer's recommendation. Joints shall be tested in accordance with ASTM D3212 "Joints for Drain and Sewer Plastic Pipe using Flexible Elastomeric Seals".

The Contractor's particular attention is called to the manufacturer's recommended practice and the Contract Drawings for installing bedding and for haunching. The haunching area shall be extended at least to the springline of the pipe and shall be tamped in a satisfactory manner.

**LATERALS.** Laterals are to be 6" pipe. Each property owner along the route of the sewer is to be contacted by the contractor and given the opportunity to indicate in the field where they would like the lateral which will serve their property installed. The contractor is to verify that the location selected by the property owner meets all Health Code and other requirements for separation distance from a water line or well. All laterals are to be laid such that they end with a bell. Laterals are to extend 5 feet beyond the curb or edge of pavement or to the right of way line if the right of way line is less than 5 feet from the curb or edge of pavement. Laterals are to be properly plugged. A Fernco plug is an acceptable plug. The location of the end of the lateral is to be marked by placing a vertical wooden stake extending from a point near the end of the lateral to a point approximately 6" below finished grade. A steel plate 4"X 4"X1/4" shall be fastened to the top of the wooden stake. Where a lateral is installed in rock, the rock is to be blasted to a point 5 feet beyond the end of the lateral.

**LATERALS-PRECAST DROP CONNECTIONS.** As an alternate to the cast-in-place drop connections shown on the Detail Sheet, the Contractor may furnish and install with City approval Precast Sewer Chimneys as manufactured by Superior Products Distributors, Inc. or approved equal. Precast sewer chimneys shall consist of a base section, one or more intermediate sections and a top section. Concrete for precast sections shall have a minimum compressive strength of 4,000 pounds per square inch.

The base section shall be of bridge and base pad design with both pads and bridge cast as a monolithic unit, and with pads having a total minimum bearing area of 6 square feet. The outside width perpendicular to the mainline sewer shall be 36" for sewers up to 15-inch diameter and 48" for 18-inch diameter sewers and larger. The bridge section shall encapsulate a captive gasket unit and be joined to the mainline vertical positioned tee with a 6-inch PVC nipple with a minimum length of 12", tapered at both ends. The upper side of the captive gasketed unit shall be suitable to receive a 6-inch PVC SDR-35 riser pipe. The base section shall allow for a normal amount of settlement to occur without transmitting the weight of the chimney assembly to the main line sewer pipe.

Intermediate sections shall have a minimum outside measurement of 18" square, and be hollow cored with a round 8.4" inside diameter, to allow installation by lowering over a 6-inch PVC riser pipe. Various lengths of intermediate sections shall be used in combination to obtain the correct height with the fewest joints.

The top section or cap block shall be precast and capable of rotation of 180 degrees and/or 15 degrees from right angle to accept service connections. The cap block shall encapsulate a 6"X6" PVC tee on one side to accept the service connection and a 6-inch PVC cleanout plug on the top. The bottom of the tee shall be gasketed and shall form a tight seal when installed over the tapered end of a PVC riser pipe. Service connection shall be suitable for connecting to 6-inch PVC SDR 35 pipe.

Precast sewer chimneys shall be installed in accordance with the manufacturer's instructions. Base section shall be set on crushed stone placed and thoroughly compacted in 6" lifts from

the bottom of the trench to the top of the pipe. The entire base of the precast chimney shall be wrapped in a non-woven geo-textile fabric. The fabric shall have a minimum weight of 3.5 oz/s.y., a minimum Mullen Burst Strength of 200 psi, and a minimum puncture strength of 55 pounds and be equivalent to Exxon 125 EX or Carthage Mills FX-35HS or Mirafi 140 NL. The fabric shall be installed so that it overlaps onto the crushed stone base a minimum of two feet. The top of the fabric shall be secured to the chimney where the base and intermediate sections are bolted together. Top section, intermediate sections and base section shall be attached to each other with bolt-on hardware. Precast chimney shall be designed for double serviced connections where applicable.

**COUPLINGS AND ADAPTORS.** Couplings and adaptors for joining different kinds of pipe shall be of the type manufactured for the use and kind of pipe to be joined. All couplings and adaptors shall be approved by the Engineering Division of the City of Danbury Public Works Department.

The Contractor is required to use watertight plugs, joints, etc., such that successful tests can be attained.

**PIPE BEDDING.** Required foundation material shall be crushed stone or gravel as approved by the Engineering Division. Waterstops constructed of suitable dead sand shall be placed at all joints, including pipe joints at fittings, manholes and structures, to a distance of 12" beyond each pipe joint (in both directions). The dead sand is to be placed to the same height as the bedding material and shall prevent the flow of groundwater under the pipe. All pipe is to be installed on dry bedding.

**BACKFILLING.** Unless otherwise specified or directed, all trenches and excavations shall be backfilled immediately after installation and inspection of the pipe.

Selected material from excavation shall be used for backfilling trenches along and over the pipe to a level 12" above the top of the pipe and shall be earth, sand, or well-graded gravel with a maximum size of 4". The contractor shall store suitable material from excess excavation and from other portions of the work for use as backfill. It shall be carefully deposited in uniform layers not exceeding 6" in depth, and unless otherwise permitted, each layer shall be carefully and solidly mechanically compacted in such a manner as to avoid disturbing the completed work. Compaction testing may be required.

Prior to backfilling the remainder of the trench, a metallic tape shall be installed 12" to 18" below the ground or road surface. The metallic tape shall be as manufactured by Allen Systems, Inc., Wheaton, Illinois, or approved equal. The tape shall be a minimum 3" wide and consist of a minimum thickness 0.35 mils solid aluminum foil core running the full length and width. The aluminum foil core shall be encased in a protective, high visibility, safety precaution green inert plastic jacket that is impervious to all known alkalis, acids, chemical reagents, and solvents found in the soil. The requirement for the installation of metallic pipe applies to all new mains and laterals.

Backfilling for the remainder of trenches and excavations shall be approved material free from organic material. No large stones shall be used in the trench until there is at least one foot of fill over the top of the pipe or around the structure. In depositing stone, care must be taken not to damage the pipe or structure. Stones which are used in backfilling shall be no greater than 8 inches in size so distributed through the mass that all interstices are filled with

fine material. Backfill shall be deposited in layers not to exceed 6" in depth and solidly compacted by mechanical means. Compaction testing may be required.

Materials and methods related to backfilling shall be in accordance with Connecticut Department of Transportation specifications.

**TESTING**. Pipelines are to be tested in accordance with the City of Danbury standard specification for testing.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
SANITARY SEWER MANHOLES**

June 1, 1988

Revised November 10, 1994

Revised September 28, 1995

Revised September 24, 1996

Revised November 5, 1996

Revised September 20, 2004

**GENERAL.** All pertinent State and Federal requirements/regulations relating to excavations and construction in general (including but not limited to OSHA and "Call Before You Dig") are to be complied with at all times.

**MANHOLES.** Manholes for sanitary sewers shall be constructed of precast reinforced concrete sections in accordance with ASTM Designation C478. Manholes are to be complete with rungs, base section and cast iron frame and cover.

Joints of the precast reinforced concrete sections shall be formed entirely of concrete and shall be made with a rubber "O" ring gasket installed in accordance with the manufacturer's recommendations. An acceptable alternate is the use of a butyl sealant in conjunction with the "O" ring rubber gasket installed in accordance with the manufacturer's recommendations. An acceptable alternate is the use of properly installed butyl rubber based sealants per Type B, AASHTO M198, but no bitumen content. Joints shall be self-centering and watertight against internal and external hydrostatic pressure with only the gasket utilized as the sealing element and shall pass the required vacuum test.

Base and riser sections shall be furnished by the manufacturer with factory installed flexible pipe to manhole connectors. The connectors shall be: a compressible rubber ring equal to the Omega manhole, with a flexible sleeve equal to the Interpace flexible manhole sleeve; a factory installed Kor-N-Seal flexible pipe-to-manhole connector or a factory installed PSX: Positive Seal Series Six gasket system as manufactured by Press-Seal Gasket Corporation.

Flexible pipe to manhole connectors are to be factory installed for all new manholes. Field installation in existing manholes is to be done according to the manufacturer's recommendations. In all installations the gap between the pipe and the rubber connector is to be properly filled with grout by the contractor during construction.

Cone sections and flat eccentric tops shall have a precast opening capable of properly accepting the City standard frame and cover.

An acceptable alternate to the City standard outside drop connection detail is the Precast Outside Drop produced by Arrow Concrete Products, Inc. Concrete is to be 4,500 PSI, 28 days concrete and reinforcement is to be A-615 Grade 60 linear feet (see detail).

**RUNGS.** Rungs shall be installed in the vertical sides of the manhole sections on 12" centers.

An acceptable manhole rung is the "safety green" phosphorescent copolymer polypropylene plastic coated 1/2" grade 60 steel reinforcement step Model No. PS2-PFSL as manufactured by M.A. Industries, Inc. These rungs must be factory installed by the manufacturer of the manhole.

An acceptable manhole rung is the Press-Seal Gasket, steel reinforced (Grade 60 steel), copolymer polypropylene 14" manhole safety step part #P-14850 with built in reflectors. These rungs must be factory installed by the manufacturer of the manhole.

**FRAMES AND COVERS.** Manhole covers shall be City of Danbury Standard Campbell Foundry Pattern # 5022 or an approved equal. Manhole frames shall be Campbell Foundry Pattern # 1222 with ribs and 1" diameter lifting holes in the bottom flange and ribs.

**TESTING.** The Contractor shall furnish all labor, equipment and materials to vacuum test all new manholes. Each manhole shall be tested immediately after assembly, prior to setting the frame and prior to backfilling. Testing shall be in strict accordance with manufacturer's instructions.

All lift holes shall be plugged with an approved non-shrink grout. All pipes entering the manhole shall be plugged taking care to securely brace the plug from being drawn into the manhole during testing.

The test head shall be placed at the inside of the top of the cone section or flat slab and the seal inflated in accordance with the manufacturer's recommendation.

A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds as required for 48" diameter manholes or if the time is greater than 90 seconds for 72" diameter manholes.

If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.



**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION**

**DEEP MANHOLE**

(18 feet and deeper)

April 4, 2006

Structural Aluminum. Aluminum structural shapes and plates shall be alloy 6061-T6. All aluminum fastenings shall be with type 316 stainless steel bolts, nuts and washers.

Anchor Bolts. All anchor bolts and hardware used shall be of sufficient size to provide the necessary support as shown, ordered or required, and in no case less than  $\frac{3}{4}$  inch diameter. They shall be of 316 stainless steel and provided with washers and hex nuts.

Concrete Anchors. Concrete anchors shall be stainless steel, self-drilling, flush type, and of the sizes shown, ordered or required, equal to Phillips Red-Head concrete anchors as manufactured by Phillips Drill Company or Anchors manufactured by Gregory Industries, Inc. The number of units per anchor shall be adequate to develop the full strength of the bolt.

Gratings and Frames. Gratings shall be cold forged aluminum alloy 6063-T6 equal to Bustin Aluminum Products Company, Inc. Serrated Top, Type A, minimum 1 inch deep. Gratings and frames shall be designed to support a uniform live load of 300 psf. Grating shall be accurately fabricated, free from warps, twists or other defects which affect their appearance or serviceability. Aluminum grating, frames, anchors, inserts, and accessories shall be provided, as shown or required.

Gratings shall be installed in easily removable sections, weighing not more than 150 lbs. per section, with all edges banded. Adjacent sections shall be neatly fitted together. The maximum size of grating sections shall be 6 feet by 23 inches to facilitate entry through the existing manhole openings. Grating shall be set with full and uniform bearing on aluminum frame to preclude rocking movement. Four type 316 stainless steel fastening devices shall be installed per section, as detailed, to hold the grating rigidly to the supports with means for easy removal. The fasteners shall not protrude above the walkway surface of the grating unless otherwise shown. All other grating requirements shall conform to the standards of the Metal Grating Institute.

For attachment to vertical faces, the grating frame shall be of aluminum alloy 6061-T6 and mitered and welded at corners, with welds ground smooth.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
SANITARY SEWER TESTING**

Revised November 10, 1994

Revised September 28, 1995

**GRAVITY SEWER MAIN.** All piping shall be tested for infiltration and exfiltration as ordered by the Engineer. The contractor shall use every precaution necessary during the construction of these sewers to ensure that the following test results can be attained. Infiltration in PVC sewers shall be limited to a maximum 100 gallons per day per inch of internal diameter per mile of pipe. Infiltration in cast iron or ductile iron sewers shall be limited to 25 gallons per day per mile per inch of internal diameter of pipe. If infiltration exceeds the specified amounts, the contractor shall do whatever is necessary to reduce infiltration to these limits. The duration of each test shall be no less than 8 hours. If groundwater levels should be less than one foot above the crown at the pipe sections to be tested, the Engineer may require testing during an alternate season or may require exfiltration tests. For exfiltration tests the test section shall be sealed and filled with water to a level three feet above the crown of the upstream manholes; the water loss measured over an 8 hour period shall meet the infiltration limits.

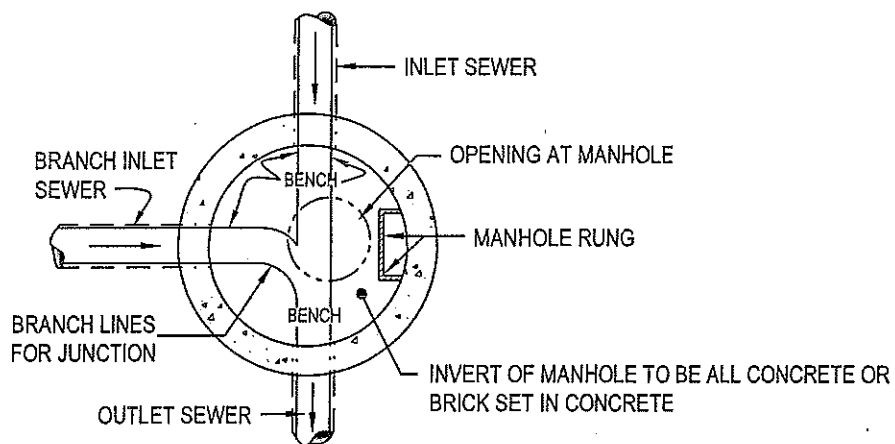
Low pressure air testing may be allowed with the approval of the City Engineer. Standard testing procedures acceptable to the City are to be followed. A constant pressure between 3.5 psig and 5.0 psig in excess of groundwater pressure is to be reached . When this pressure has been reached, the air supply is to be cut off and the internal pressure allowed to stabilize for five minutes. After stabilization, the air pressure is adjusted to 3.5 psig in excess of groundwater pressure and the air supply again cut off. The internal pressure is to be monitored for the appropriate length of time ( reference tables outlining minimum air test duration versus pipe size). A pressure loss greater than 0.5 psig over the minimum air test duration time period constitutes failure of the section of pipe.

**MANHOLES.** All new manholes shall be vacuum tested. Each manhole shall be tested immediately after assembly prior to setting the frame and cover and prior to backfilling. Testing shall be in strict accordance with manufacturer's instructions. All lift holes shall be plugged with an approved non-shrink grout. All pipes entering the manhole shall be plugged taking care to securely brace the plug to keep it from being drawn into the manhole during testing. The test head shall be placed at the inside of the top of the cone section or flat top and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds as required for 48" diameter manholes or if the time is greater than 90 seconds for 72" diameter manholes. If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

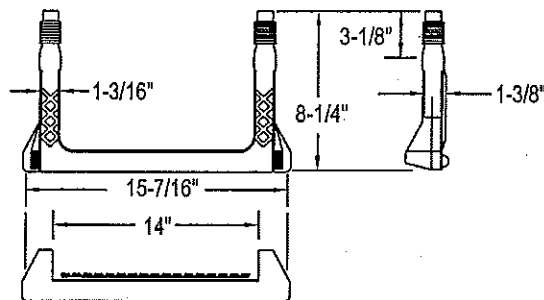
Manholes shall be free of visible leakage. Any leakage shall be repaired to the satisfaction of the Engineer.



<p>CITY OF DANBURY ENGINEERING DIVISION</p>	<p>SANITARY SEWER SECTION STANDARD MANHOLE DETAIL</p>	<p>CHECKED BY: D.W.N.</p>	<p>DRAWN BY: P.J.T.</p>
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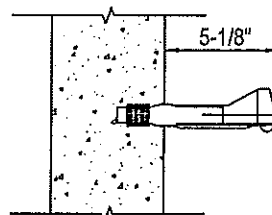
PLAN  
SECTION  
STANDARD MANHOLE



ALTERNATIVES:

I. M.A. INDUSTRIES, INC.  
MODEL NO. PS2-PFSL  
CO POLYMER POLYPROPYLENE  
PLASTIC COATED 1/2"  
GRADE 60 STEEL REINFORCEMENT  
WITH REFLECTOR.

II. PRESS-SEAL GASKET CORP.  
STEEL REINFORCED,  
CO POLYMER POLYPROPYLENE,  
14" MANHOLE SAFETY STEP  
PART # P-14850 WITH REFLECTOR.



MANHOLE STEPS FOR  
CONCRETE STRUCTURES

(NOT TO SCALE)

\* ALL RUNGS/STEPS ARE TO BE FACTORY INSTALLED IN NEW MANHOLES

REVISIONS

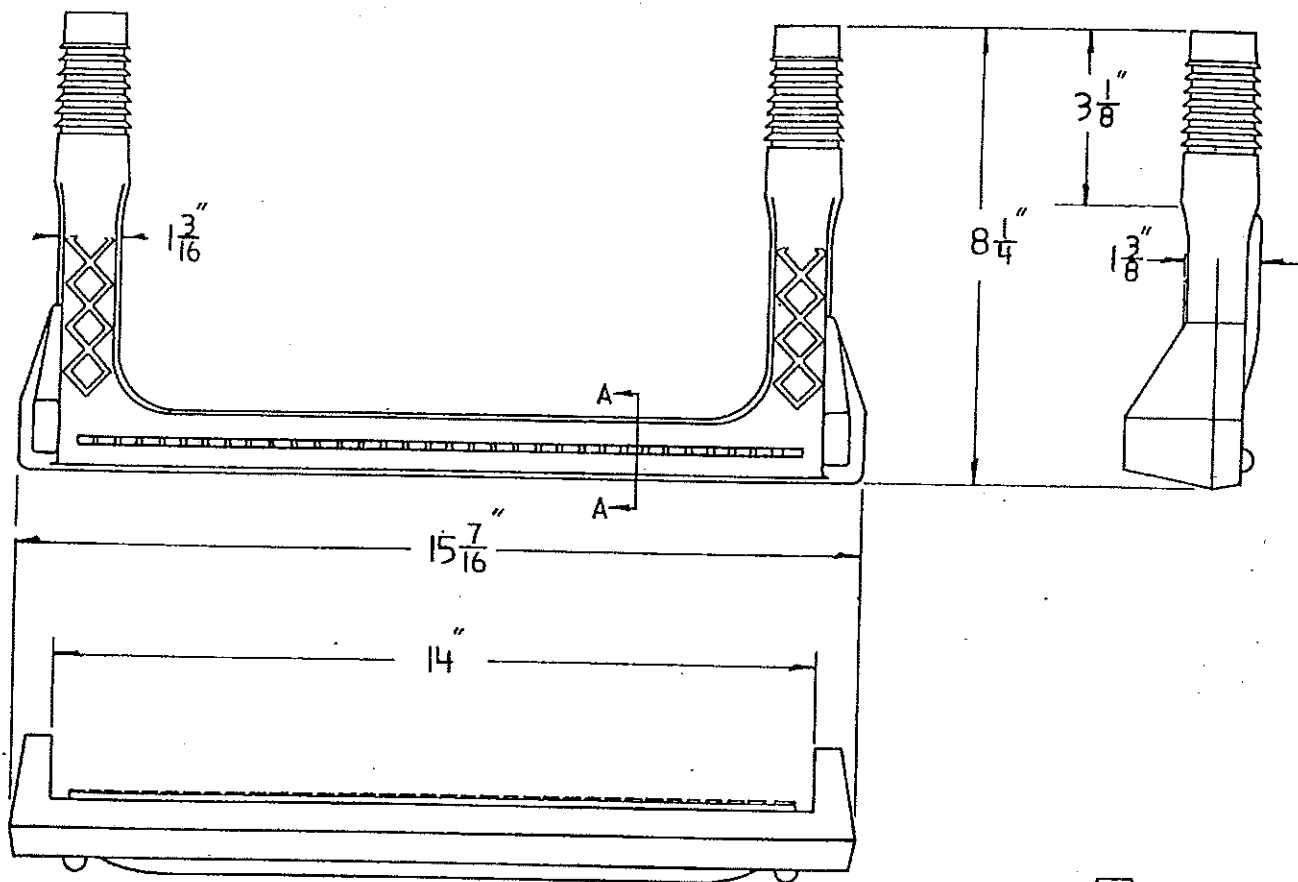
No.	DATE	COMMENTS
1	6/5/2012	

CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
STANDARD MANHOLE  
RUNG/STEP

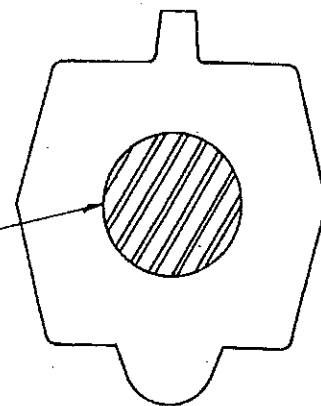
CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

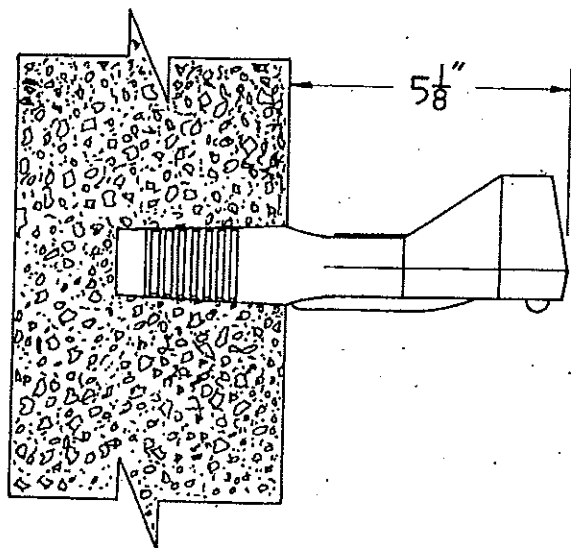


**Copolymer Polypropylene Plastic**

$\frac{1}{2}"$  GRADE 60 STEEL REINFORCEMENT



SECTION-A



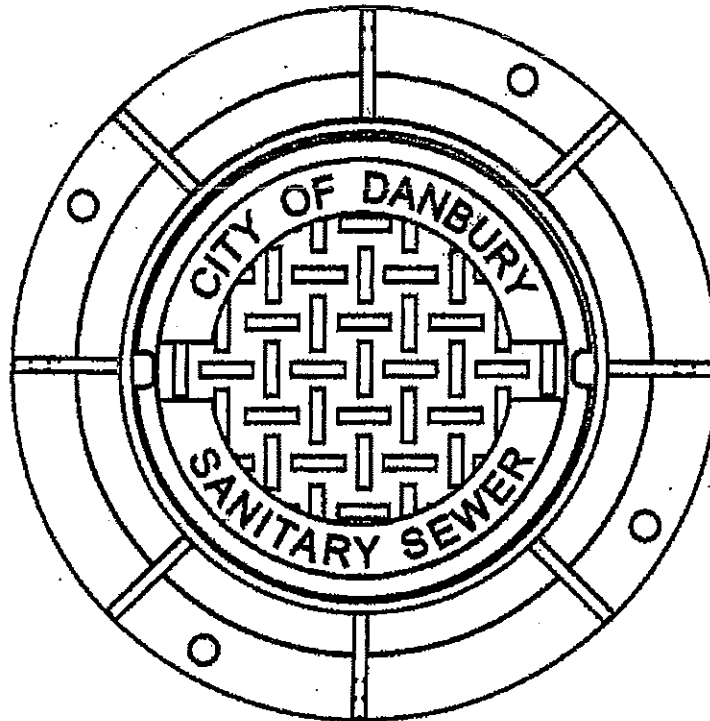
**PS2-PFSL**

**Manhole Step**



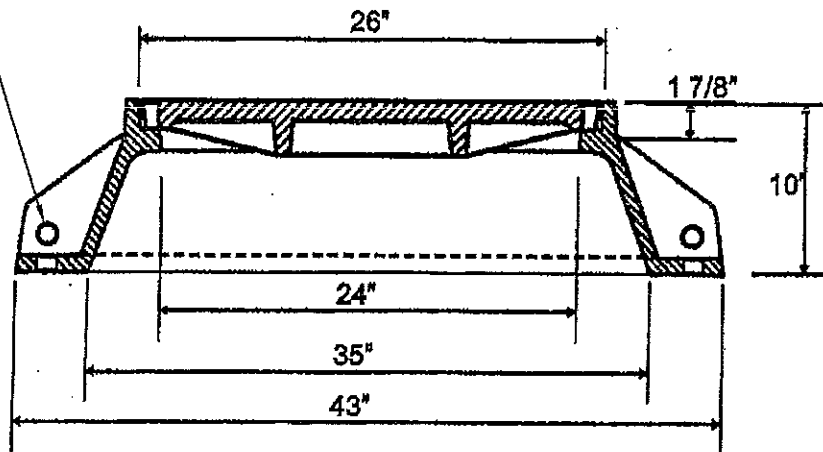
**M.A. Industries Inc.**  
**303 Dividend Drive**  
**Peachtree City Ga.**  
**30269**

DANBURY STANDARD COVER  
 CAMPBELL FOUNDRY  
 PATTERN #5022  
 OR EQUAL



FRAME CAMPBELL FOUNDRY  
 PATTERN #1222  
 OR EQUAL

ADD 1" DIAMETER  
 RIB HOLES



(NOT TO SCALE)

REVISIONS		
No.	DATE	By
1	6/5/2012	P.J.T.

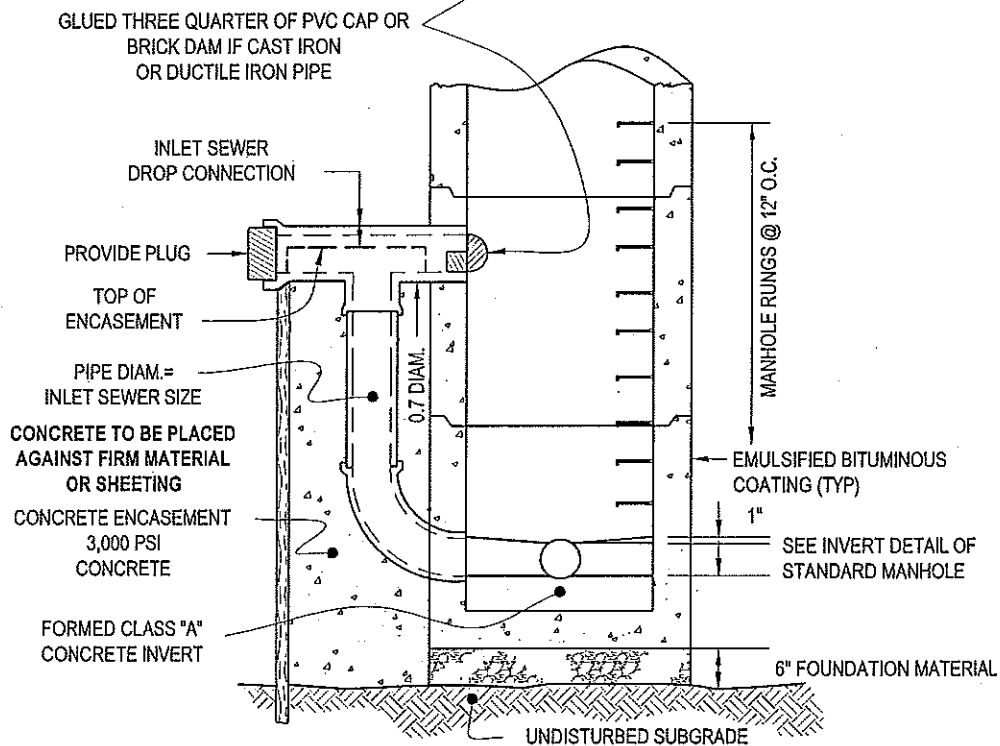
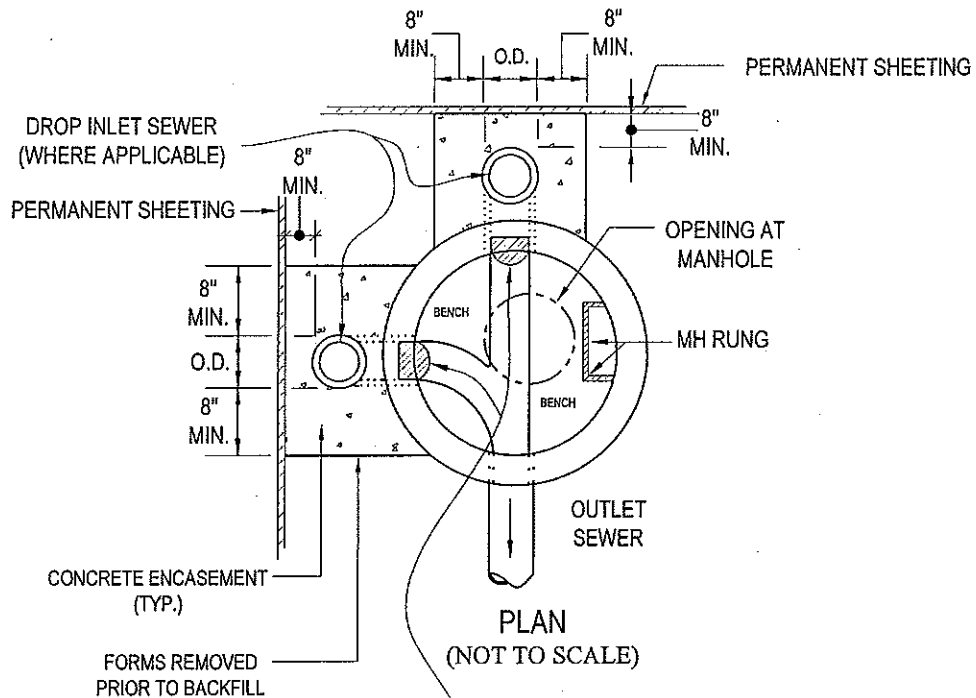
CITY OF DANBURY  
 PUBLIC WORKS  
 DIVISION

SANITARY SEWER  
 STANDARD MANHOLE FRAME AND COVER

DETAIL

DATE: 4/22/2002

DRAWN BY: P.J.T.



# REVISIONS

No.	DATE	COMMENTS
1	3/13/2012	

CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
DROP MANHOLE  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

Milford Plant  
539 Oronoque Road  
Milford, Connecticut

Arrow Concrete Products, Inc.  
560 Salmon Brook Street  
Granby, CT 06035  
(860) 653-5063

Norwich Plant  
21 Vergason Avenue  
Norwich, Connecticut

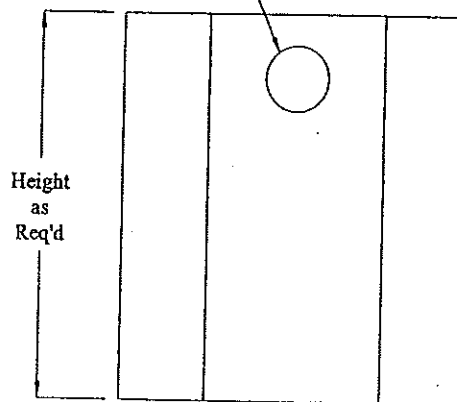
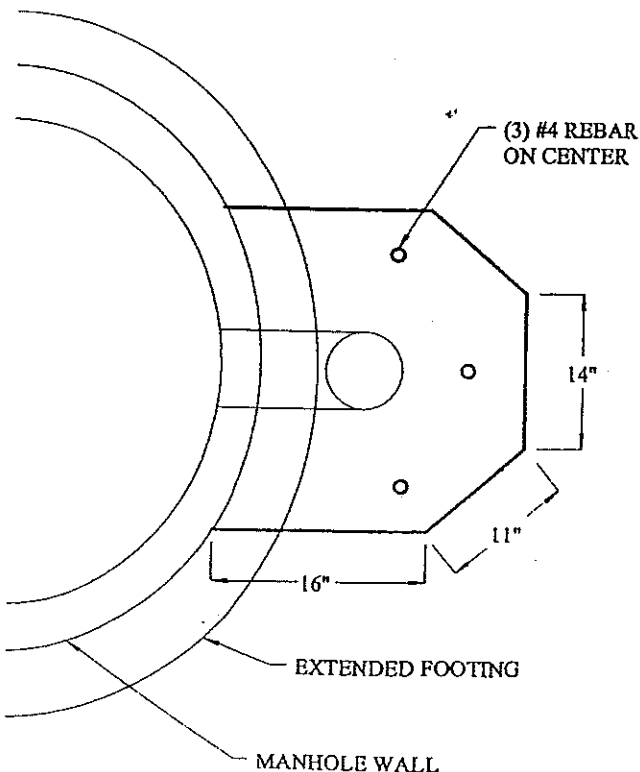
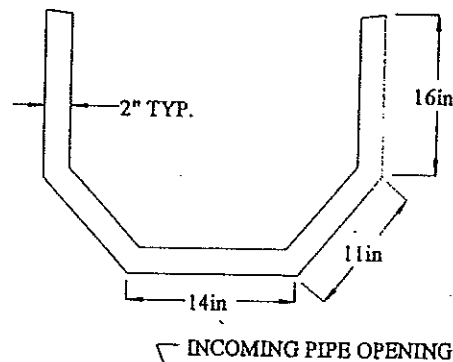
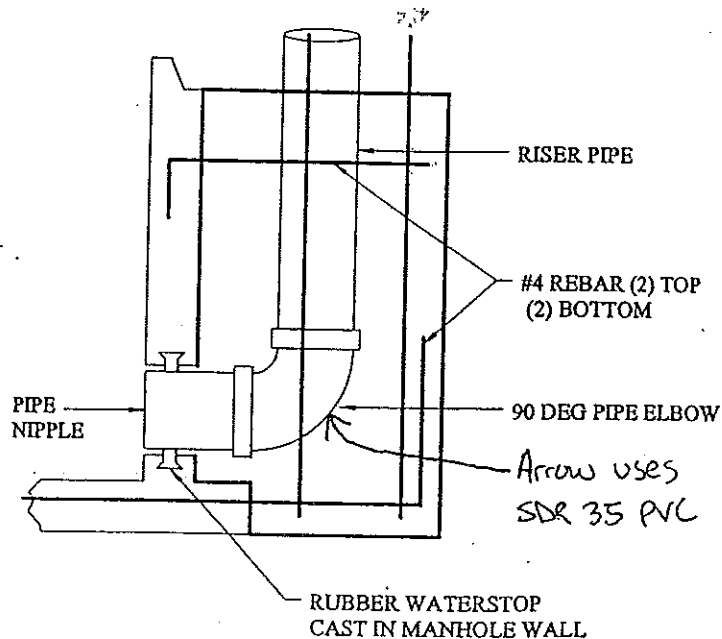
## DESIGN NOTES

1. CONCRETE - 4500 PSI, 28 DAYS

2. REINFORCEMENT - A-615 GRADE 60  
LINEAR FT

### ADVANTAGES:

DROP UNIT IS CAST ON MANHOLE BASE  
ENSURING A POSITIVE BOND WHICH  
ELIMINATES SETTLING OR SHIFTING.  
RISER FORM BLOCKS GIVE CONTRACTOR  
FLEXIBILITY TO ADJUST INCOMING PIPE  
ELEV. NO FORMS ARE REQUIRED.

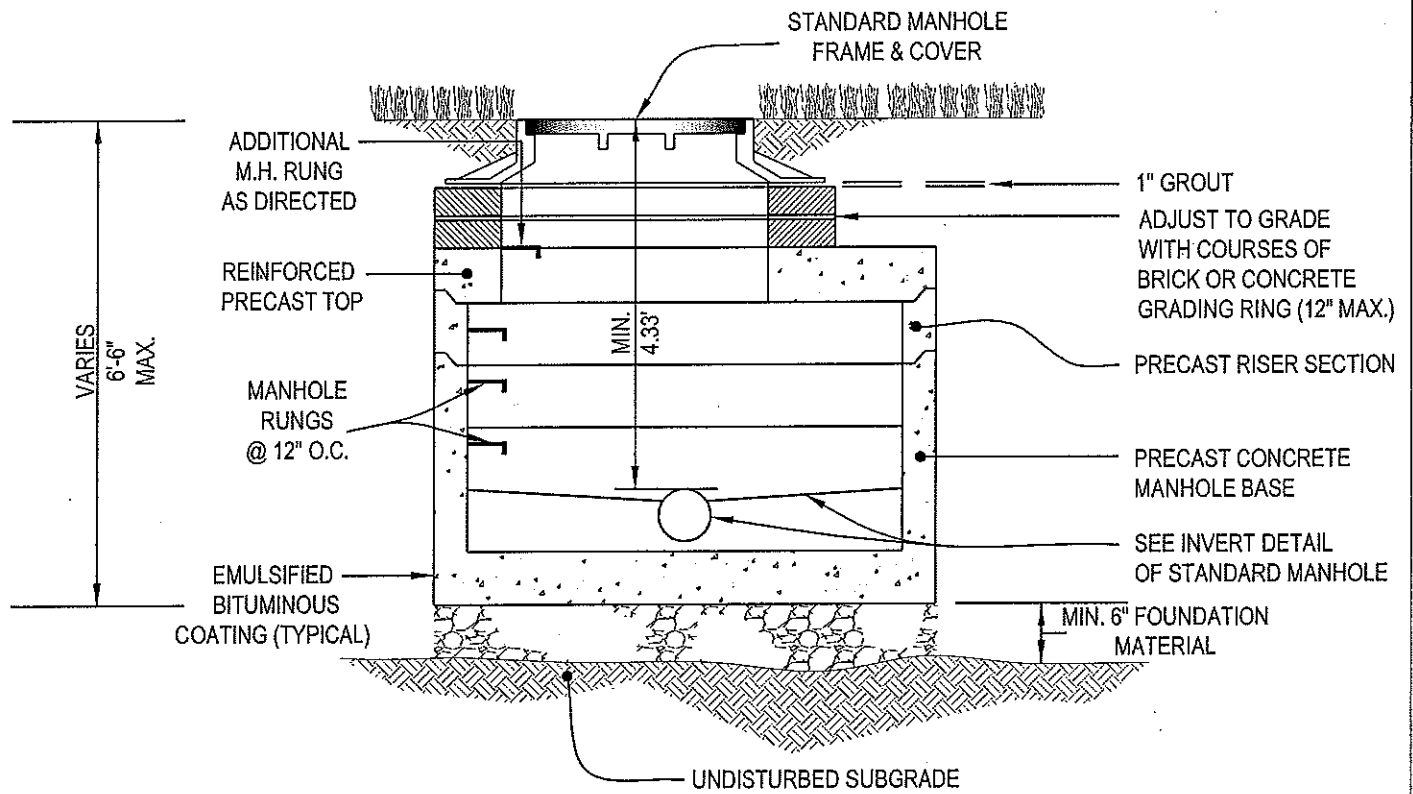


RISER FORM BLOCK

PRECAST OUTSIDE DROP

CITY OF DANBURY  
ENGINEERING DIVISION





(NOT TO SCALE)

NOTE: REINFORCED PRECAST TOP TO BE CAPABLE OF HANDLING H-20 WHEEL LOADINGS

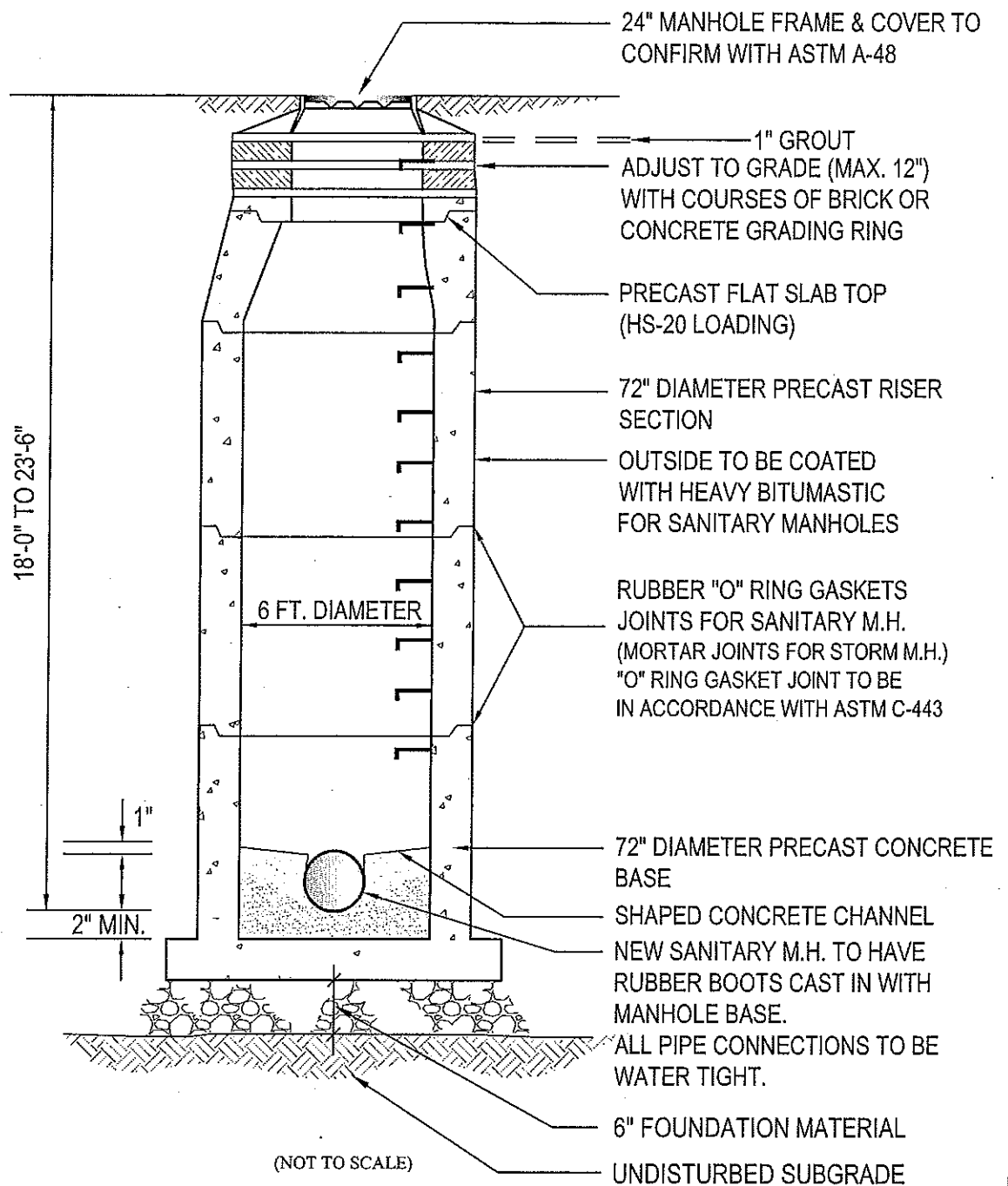
REVISIONS		
No.	DATE	COMMENTS
1	3/13/2012	

CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
SECTION SHALLOW MANHOLE  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



**NOTES:**

1. BACK FILL AT M.H. SHALL BE COMPACTED TO DENSITIES REQUIRED ON PIPE BEDDING DETAIL
2. PLACE M.H. ON 6" OF COMPACTED WELL GRADED GRANULAR MATERIAL WITH STONES NO LARGER THAN 1/2" IF M.H. IS TO BE PLACED ON FILL. ALL FILL SHALL BE COMPACTED TO 95% OF MAX PROCTOR DENSITY AS PER ASTM D-1557.
3. FURNISH WITH STANDARD M.H. RUNGS (NO LADDER)
4. SEE REQUIREMENTS OF STANDARD SANITARY SEWER M.H.

**REVISIONS**

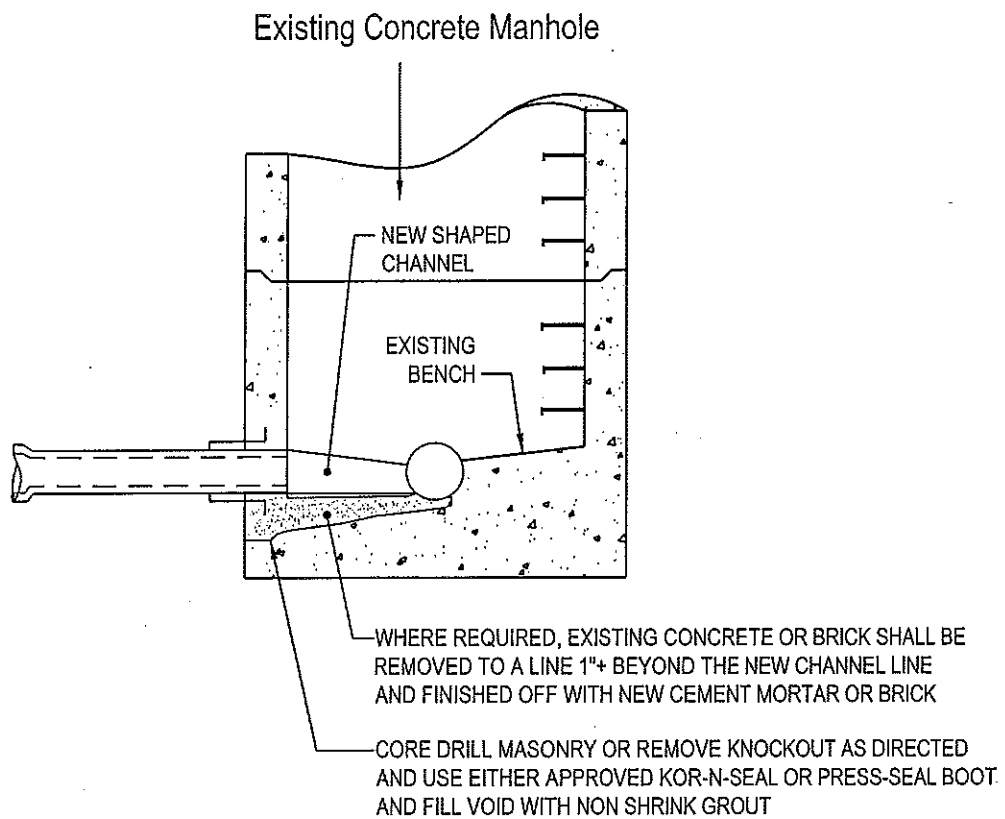
No.	DATE	COMMENTS
1	3/13/2012	

**CITY OF DANBURY  
ENGINEERING  
DIVISION**

**SANITARY SEWER  
DEEP MANHOLE  
18 FEET AND DEEPER  
DETAIL**

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



NOT TO SCALE

REVISIONS		
No.	DATE	By
1	3/13/2012	P.J.T.

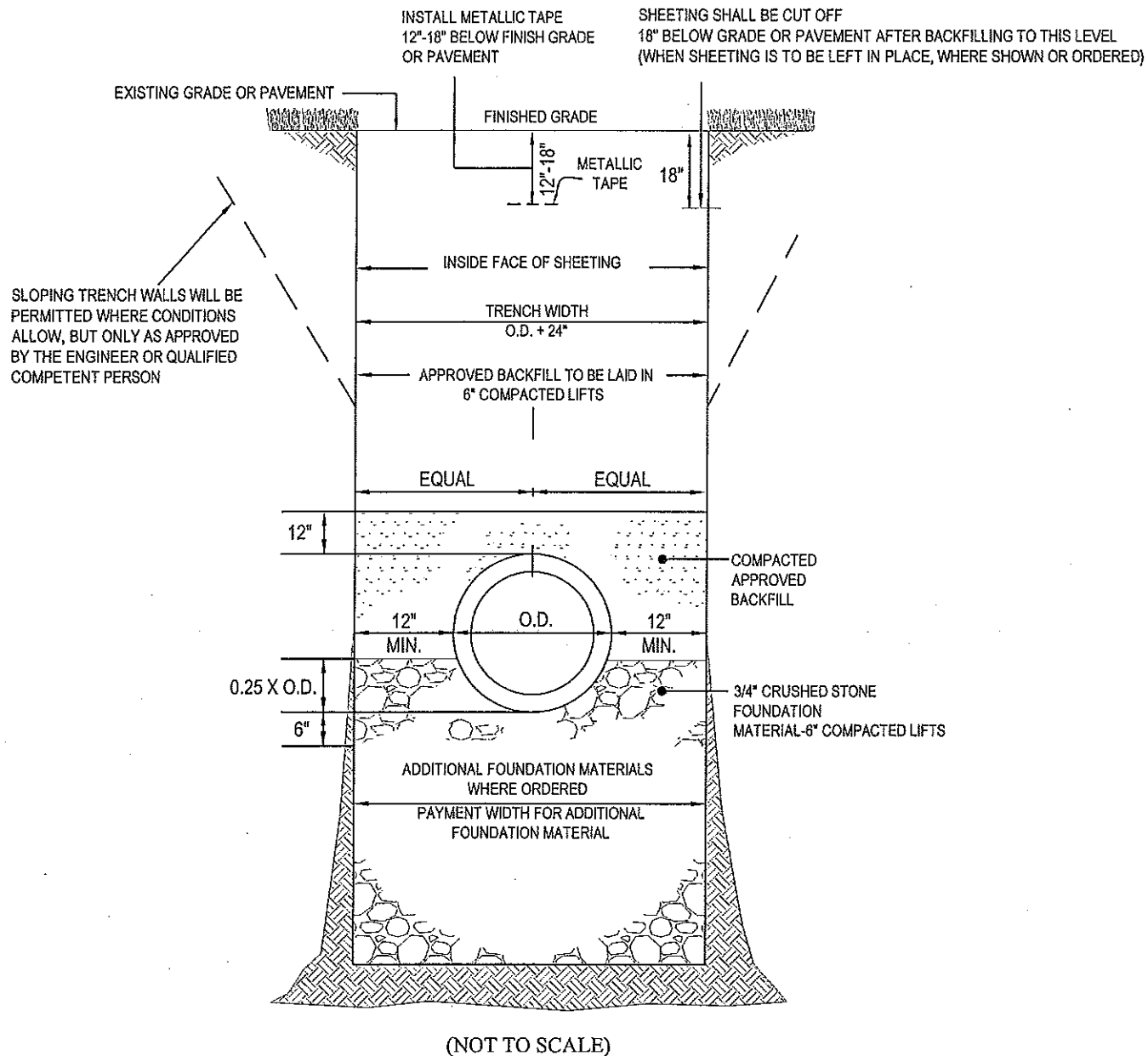
CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
NEW CONNECTION TO EXISTING MANHOLE

DETAIL

DATE: 4/22/2002

DRAWN BY: P.J.T.



NOTE: DEAD SAND WATERSTOPS ARE TO BE PLACED AT ALL JOINTS INCLUDING JOINTS AT MANHOLES AND FITTINGS. THEY ARE TO EXTEND 12" BEYOND EACH PIPE JOINT (IN BOTH DIRECTIONS) THE DEAD SAND IS TO BE PLACED TO THE SAME HEIGHT AS THE BEDDING MATERIAL

NOTE: ADJACENT UTILITIES ARE TO BE PROPERLY SUPPORTED AT ALL TIMES

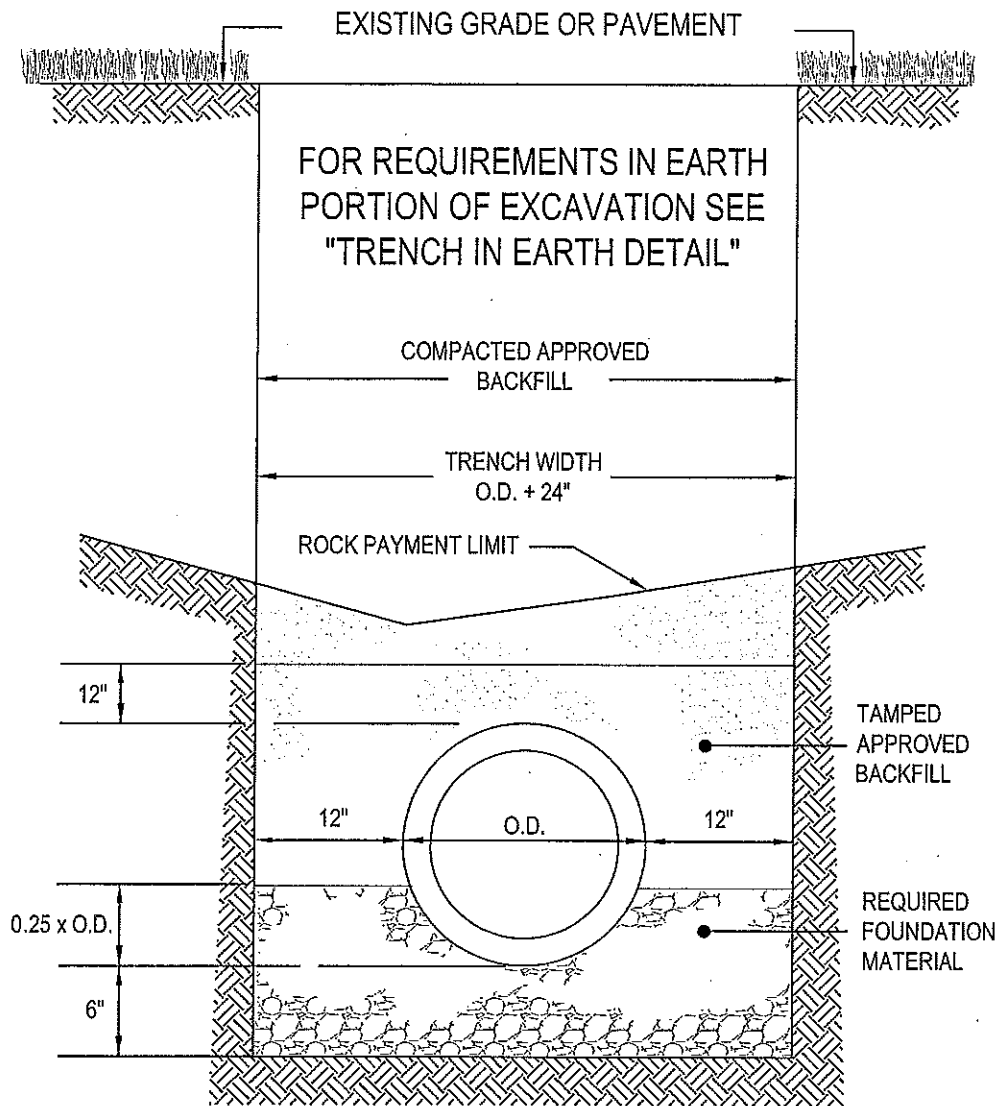
REVISIONS		
No.	DATE	COMMENTS
1	3/13/2012	

CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
TRENCH IN EARTH  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



(NOT TO SCALE)

**NOTE:**

DEAD SAND WATERSTOPS ARE TO BE PLACED AT ALL JOINTS INCLUDING JOINTS AT MANHOLES. WATERSTOPS TO EXTEND 12 INCHES BEYOND EACH PIPE JOINT (IN BOTH DIRECTIONS) THE DEAD SAND IS TO BE PLACED TO THE SAME HEIGHT AS THE BEDDING.

**REVISIONS**

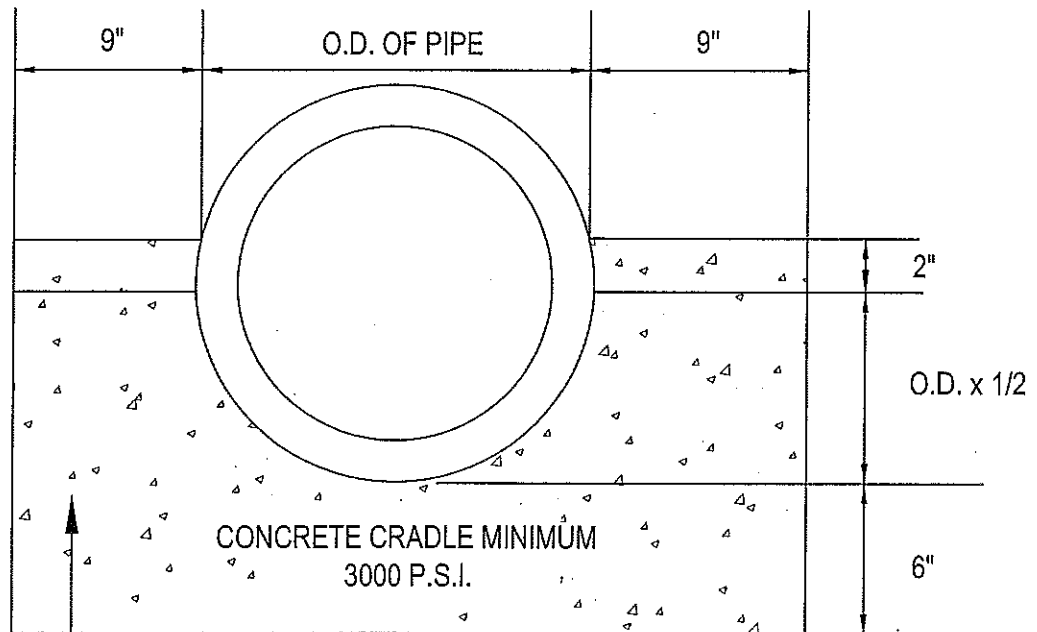
No.	DATE	COMMENTS
1	3/13/2012	

**CITY OF DANBURY  
ENGINEERING  
DIVISION**

**SANITARY SEWER  
TRENCH IN ROCK  
DETAIL**

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



(NOT TO SCALE)

REVISIONS

No.	DATE	COMMENTS
1	3/13/2012	

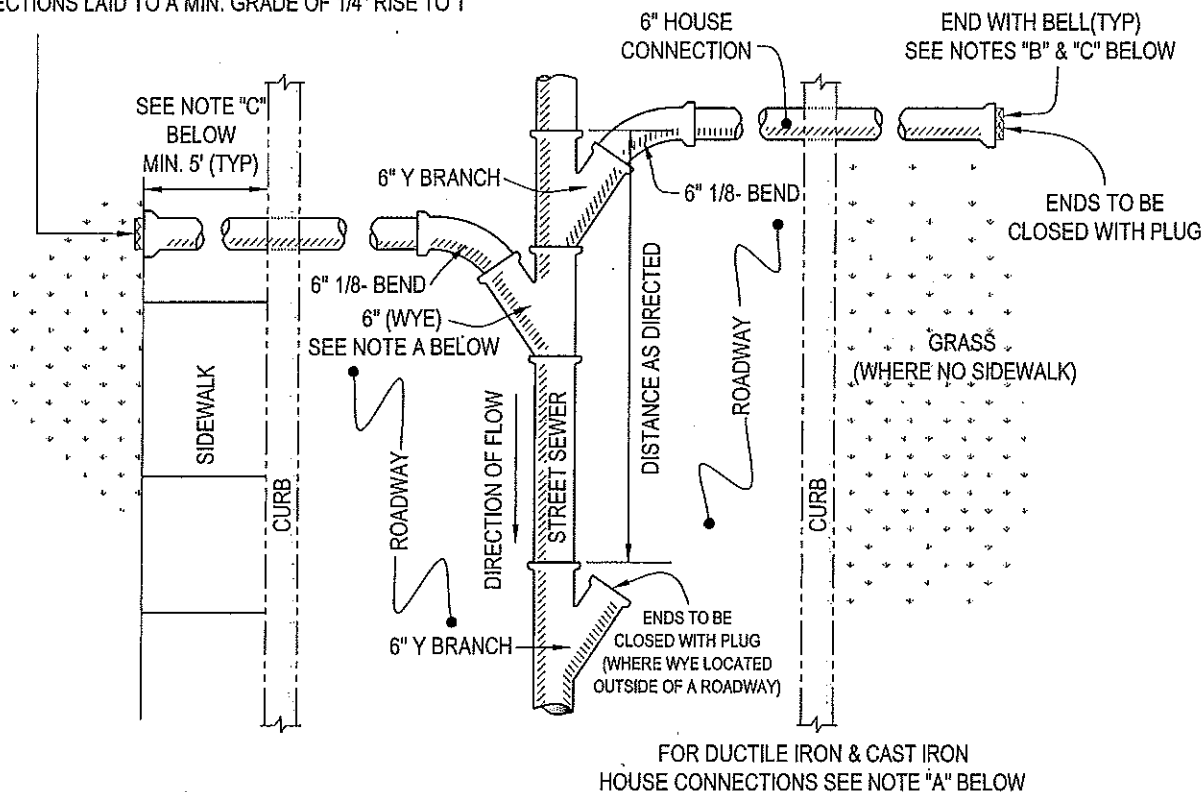
CITY OF DANBURY  
ENGINEERING  
DIVISION

SANITARY SEWER  
WET EARTH SECTION  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

MARK END OF LATERAL WITH VERTICAL WOODEN STAKE  
 EXTENDING FROM POINT NEAR END OF LATERAL  
 TO POINT 6"± BELOW FINISHED GRADE.  
 FASTEN 4"X4"X1/4" STEEL PLATE TO TOP OF STAKE.  
 HOUSE CONNECTIONS LAID TO A MIN. GRADE OF 1/4" RISE TO 1  
 FOOT RUN.



(NOT TO SCALE)

NOTE A: STANDARD HOUSE CONNECTIONS WITH DUCTILE IRON PIPE AND CAST IRON PIPE SHALL BE SIMILAR TO THAT SHOWN ABOVE. FOR DUCTILE IRON AND CAST IRON HOUSE CONNECTIONS, TEES MAY BE USED RATHER THAN WYES. WYES OR TEES ARE TO BE EITHER MECHANICAL JOINT OR TYTON TYPE FITTINGS INCLUDING PLUGS.

NOTE B: WHERE A LATERAL IS INSTALLED IN ROCK, ROCK IS TO BE BLASTED TO A POINT 5 FEET BEYOND THE END OF THE LATERAL.

NOTE C: LATERAL TO EXTEND A MINIMUM OF 5 FEET BEHIND CURB OR EDGE OF PAVEMENT OR TO PROPERTY LINE IF PROPERTY LINE IS LESS THAN 5 FEET BEHIND CURB OR EDGE OF PAVEMENT.

NOTE:  
 THE USE OF SEWER CHIMNEYS WILL BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING DIVISION INSPECTOR. WHERE THE SEWER MAIN IS OVER 12' DEEP AND THE LATERAL WILL BE AT 50° OR GREATER, A CHIMNEY MAY BE USED. THE CHIMNEY INLET IS TO BE BETWEEN 6 AND 8 FEET DEEP BELOW FINAL GRADE.

# REVISIONS

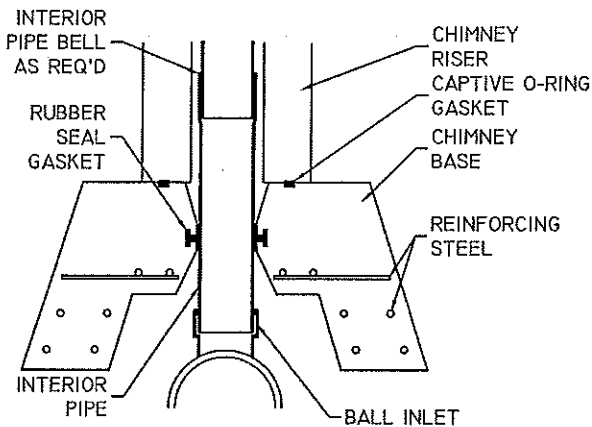
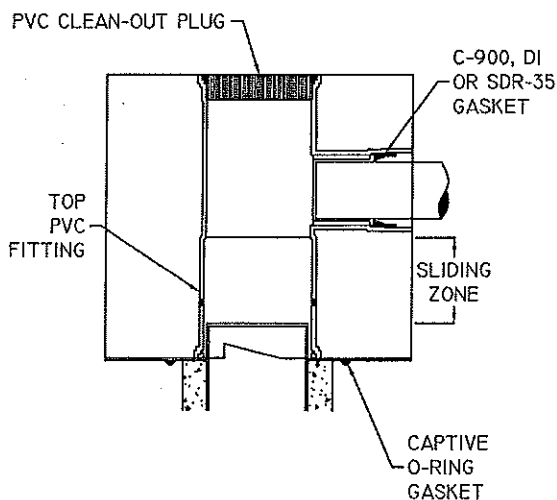
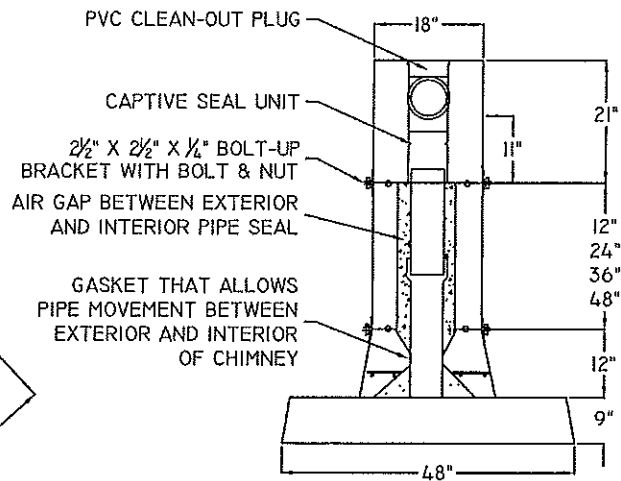
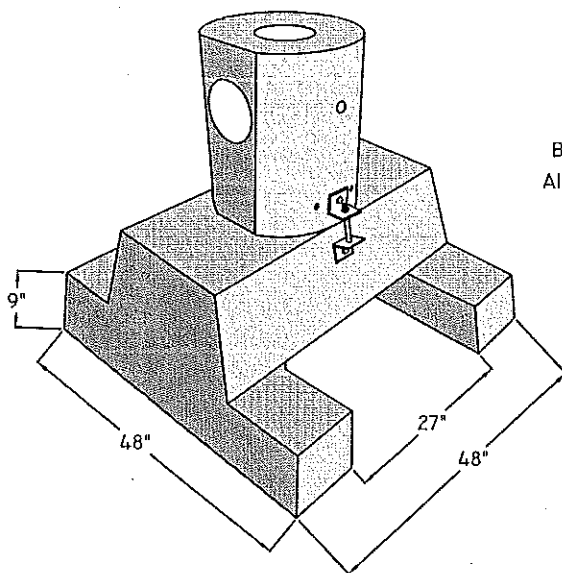
No.	DATE	COMMENTS
1	4/19/2012	

CITY OF DANBURY  
 ENGINEERING  
 DIVISION

SANITARY SEWER  
 STANDARD HOUSE CONNECTION  
 DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



PATENT 4,243,068  
 PATENT 5,189,861  
 PATENT 5,293,719  
 PATENT 5,345,728  
 PATENT 1,129,455 (CANADIAN)

DESIGN NOTES:

1. CONCRETE-5000 PSI, 28 DAYS
2. REINFORCING STEEL CONFORMS TO LATEST ASTM A615.
3. H-20 DESIGN LOADING PER AASHTO HS-20-44
4. FILL VOID UNDER BRIDGE SECTION WITH SUITABLE BEDDING MATERIAL
5. FOR USE WITH 18" Ø PIPE AND UP

ANY MODIFICATIONS TO THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ARROW CONCRETE PRODUCTS SHALL RENDER IT INVALID AND UNUSABLE  
 ARROW CONCRETE PRODUCTS  
 WWW.ARROW-CONCRETE.COM  
 OR APPROVED EQUAL.

REVISIONS

No.	DATE	COMMENTS
1	3/13/2012	

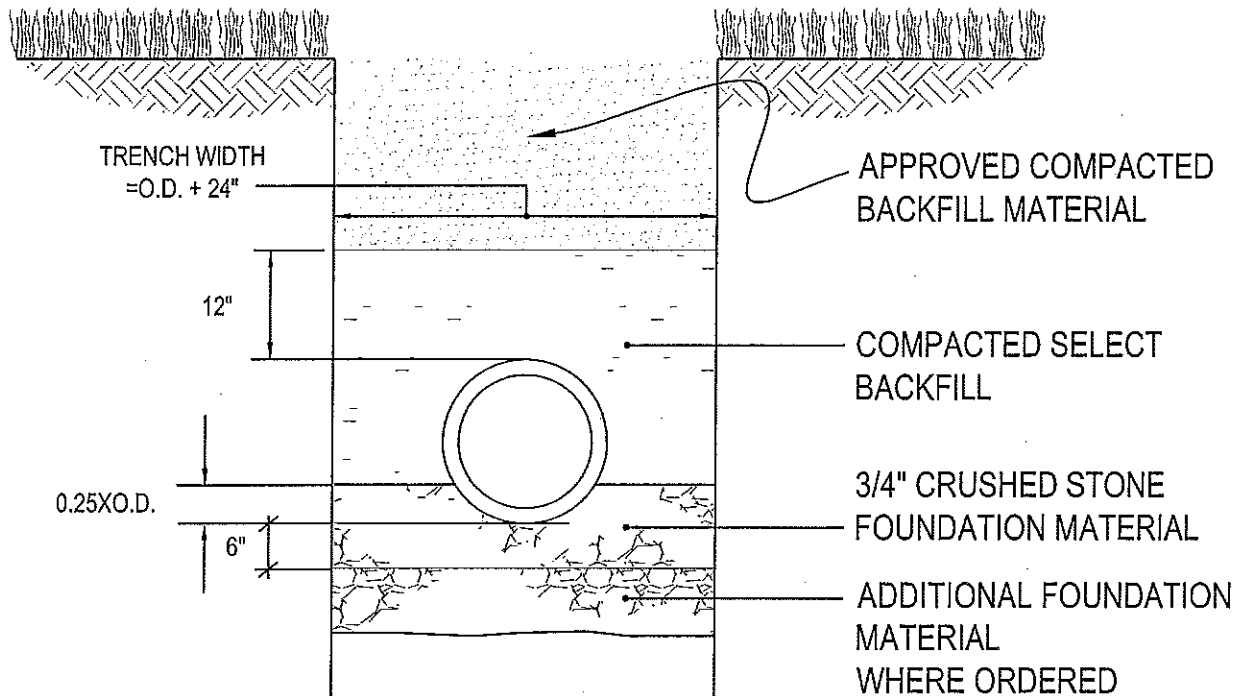
CITY OF DANBURY  
 ENGINEERING  
 DIVISION

SANITARY SEWER  
 SINGLE  
 DEEP HOUSE CONNECTION  
 WIDE BASE DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.





(NOT TO SCALE)

NOTE: PVC SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

# REVISIONS

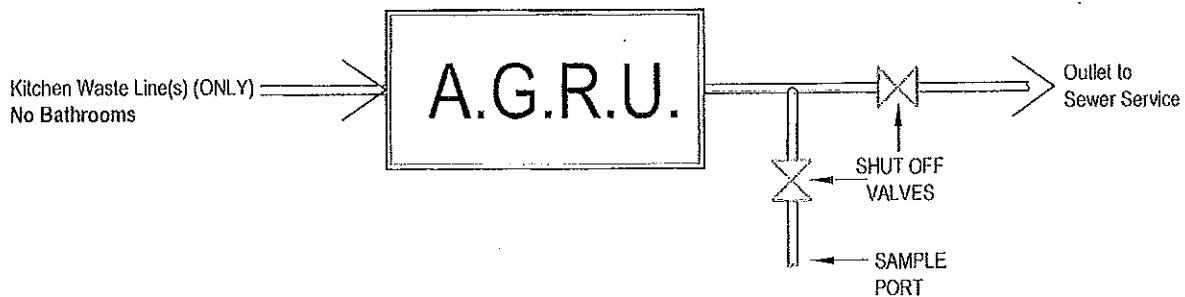
No.	DATE	COMMENTS
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CITY OF DANBURY  
ENGINEERING  
DIVISION

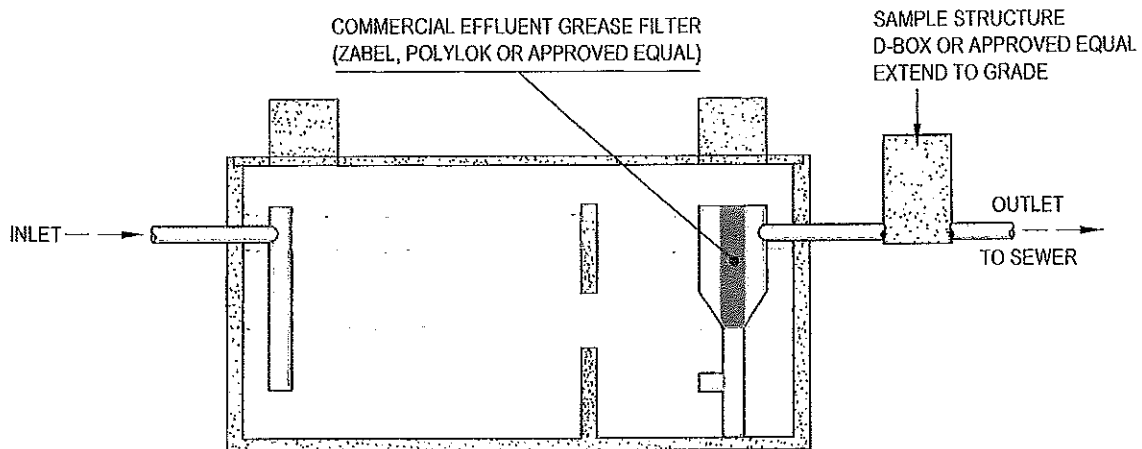
SANITARY SEWER  
TYPICAL TRENCH SECTION  
FOR HOUSE CONNECTION  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



SCHEMATIC  
INDOOR A.G.R.U. (AUTOMATIC GREASE RECOVERY UNIT)  
PLAN  
(NOT TO SCALE)



SCHEMATIC  
OUTSIDE IN GROUND GREASE TRAP  
PROFILE  
(NOT TO SCALE)

**GENERAL NOTES:**

1. UNITS SHALL BE DESIGNED, SIZED, INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH CT. D.E.E.P. GENERAL PERMIT.
2. INSTALLATION OF GREASE TRAP UNIT WILL REQUIRE A PLUMBING PERMIT FROM THE CITY OF DANBURY PERMIT CENTER.
3. SIZE A.G.R.U. IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS TO PROPERLY PRE-TREAT ALL CONNECTED FIXTURES OR DRAINS.
4. OUTSIDE IN GROUND GREASE TRAP SIZE: MIN. 1,000 GAL. OR EQUAL. TO MAXIMUM DAILY FLOW.
5. EXISTING GREASE TRAPS TO BE RETROFITTED WITH COMMERCIAL EFFLUENT GREASE FILTERS-INSTALL INSIDE OR OUTSIDE EXISTING TANK.

REVISIONS		
No.	DATE	COMMENTS
1	6/20/12	

CITY OF DANBURY  
PUBLIC UTILITIES  
SEWER DEPARTMENT

GREASE TRAP  
INSTALLATION SCHEMATIC  
FOR FOOD PREPARATION  
ESTABLISHMENT

CHECKED BY: D.D.

DRAWN BY: P.J.T.

**APPENDIX C**

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**CHECKLIST  
WATER AND SANITARY SEWER PUMPING STATIONS**

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**CHECKLIST**

**WATER AND SANITARY SEWER PUMPING STATIONS**

Notes: 1. Every item below may not apply to a particular situation.

2. This list is meant to be used as a guide only. It is not all inclusive. Each pumping station to be constructed must be designed for the particular uses and needs of its situation.
3. The design of pumping stations is to be consistent with the City's comprehensive sanitary sewer and water plans or any updated information, should it become available.

**A. GENERAL**

1. Five (5) copies of the operation and maintenance (O&M) manual prepared by the engineer and in a form acceptable to the Public Works Department of the City are to be submitted to the City upon completion of the station. Copies are to be bound in 3 ring style binders.
2. The construction of the pumping station is to be supervised by a State of Connecticut licensed professional engineer approved by the City. The engineer is to be at the job site whenever work is being done.
3. Calculations for the sizing of the wet well are to be provided for sewer pumping stations.
4. Complete plans and written specifications are to be submitted.
5. Specifications are to include all testing procedures for the pumping station.
6. Shop drawings are to be reviewed and approved by the engineer before they are submitted to the City for approval.
7. The City of Danbury Building Department is to review and approve all plans.
8. State of Connecticut Department of Environmental Protection approval of sewer pumping station plans is required. State of Connecticut Department of Health approval of water pumping station plans is required.
9. Record drawings (one mylar and one black line print) of the completed station are to be submitted to the City.
10. Two days of owner orientation are to be provided to the City prior to the turnover of the station to the City.
11. Buoyancy calculations on the wet well structure are to be provided.

12. The station must be fully operational and have been checked out by the engineer prior to the owner orientation for the City.

#### B. SITE PLAN

1. Adequate area is to be provided in sewer pumping stations for future wet well expansion, if warranted.
2. Site layout is to be such that the area in front of the station can be easily plowed via the entry gate.
3. Adequate room is to be provided in front of the station to allow trucks to back up to the doors for removal and replacement of equipment.
4. Planning Commission approval of the pumping station site plan is required.
5. The site is to be landscaped.
6. The developer is responsible for the first two cuttings of grass.
7. The driveway and parking area are to be paved.
8. Sidewalks are to be installed between all doors and as warranted elsewhere.
9. An eight (8) foot high green vinyl clad chain link fence is to be installed around the structure.
10. A twelve (12) foot wide slide type entry gate is to be provided in the fence.

#### C. BUILDING

1. Double insulated doors are to be provided. Doors are to be a minimum 36 inches wide and wide enough to pass all equipment. A single brass saddle is to be installed under the doors.
2. The doors are to be recessed three (3) to four (4) feet with a canopy over the entrance and a stoop.
3. The contractor is to use his/her own locks and keys during construction. When the station is turned over to the City, the contractor is to replace these with the City's standard locks and keys.
4. The exterior of the building is to be brick the color of which is to be approved by the City.
5. A concrete roof deck is to be provided.
6. Flashing is to be lead coated copper.

7a. The color code is to conform to the following:

floor ---	Vista Green	Pittsburgh Paints No. 2367
pedestals ---	Safety Orange	Pittsburgh Paints No. 23810
pipe ---	Blue Finesse (water)	Pittsburgh Paints No. 2075
	Slate Gray (sewage)	Sherwin Williams metal latex semigloss enamel No. MC71
ceiling ---	Spring Yellow	Sherwin Williams No. BM19-9
walls ---	Spring Yellow	Sherwin Williams No. BM19-9
doors ---	Walnut Brown	Sherwin Williams No. BM72-15
door jams ---	Walnut Brown	Sherwin Williams No. BM72-15
drains ---	Black	Sherwin Williams industrial enamel No. 617-0203

7a. The color for pipe markings (letters and arrows ) is as follows:

for gray pipe ---	black letters and arrows
for blue pipe ---	white letters and arrows
for black pipe ---	white letters and arrows

8. One unopened gallon of each color of paint is to be supplied to the City.
9. All surfaces are to be painted.
10. One outdoor light is to be provided above each door.
11. The generator and controls are to be in a room separate from the pump room. An outside generator with a shed roof is an acceptable alternative.
12. Roof insulation is to have an R value of 20 (minimum). Wall insulation is to have an R value of 13 (minimum).
13. Masonry block is to be solid or insulated hollow block.
14. The generator exhaust is to be out the rear or side of the building.

15. Gutters and leaders are to be provided as required and are to drain away from the building.
16. Adequate room to maneuver and maintain all equipment is to be provided in each room.
17. The building is to have no windows.
18. An identification sign which meets City specifications is to be mounted on the outside of the building.
19. Louvers are to be spring closed in the event of a power failure. Louvers are to be vandal proof and equipped with insect screens.

#### D. WET WELL AND PUMP ROOM

1. A forced draft ventilation system conforming to applicable regulations is to be provided for the wet well and pump room. An exterior vent for the wet well is to be provided.
2. Wall thimbles are to be installed for all inlet and outlet piping.
3. Water stops are to be installed for all concrete joints. Plans are to show construction joint locations.
4. Cast in rungs or an aluminum ladder with stainless steel hardware are to be installed in the wet well if a basket strainer is provided. If a bar rack is installed, stairs are to be constructed.
5. All lighting and equipment in the wet well and in the pump room are to be explosion proof.
6. If the wet well is deep, a platform may be required.
7. The strainer hatch is to be centered over the basket strainer.
8. Rungs are to be installed in pipe trenches where applicable (water station).
9. A hose bib is to be provided in the wet well.
10. A light is to be provided in the wet well.
11. The pump area and floors are to be pitched to drain to a sump area from which water will drain by gravity or be removed by a sump pump.

#### E. EQUIPMENT

1. A minimum of two pumps (one backup) are to be installed.

2. Flygt pumps or approved equals are to be installed in sanitary sewer pumping stations. Aurora pumps or approved equals are to be installed in water stations.
3. The City is to be provided with one spare pump.
4. Pumps are to have mechanical seals.
5. Two pressure gages per pump are to be provided.
6. Certified pump curves are to be supplied to the City.
7. A continuous means of pulling the pump chain is to be provided. An acceptable alternative is a stainless steel cable with a winch. A pump lift hook is to be installed.
8. Pump guide rail is to be galvanized with stainless steel anchors. Pump guide rail bracing is to be installed as warranted.
9. Float elevations are to be provided.
10. The float system should be set up consistent with the attached diagram.
11. A permanent float schematic drawing for sewer or a permanent alarm sequence elevation schematic drawing for water is to be provided for the station.
12. A generator with an automatic transfer switch is to be provided.
13. The fuel tank provided with the generator shall also have a manual transfer pump to be activated manually in the event of an emergency. If an underground fuel tank is installed, a day tank with an electric supply and hand crank is to be provided.
14. A remote level gage is to be provided for the fuel tank where applicable.
15. Local pump and generator running hour meters are to be provided.
16. All equipment shall be BIF.
17. If a basket strainer is to be used, a spare basket is to be provided to the City.
18. Baskets are to have separate chain hoist arrangement and lifting ring.
19. Basket strainers are to be aluminum.
20. Basket strainers are to be set such that the top of the strainer is set below the invert of the inlet pipe.
21. A detail is to be provided which shows how the basket strainer will be removed and replaced.



22. The pump station is to be equipped with a tripod and harness arrangement so that when employees either enter a wet well or meter pit, the tripod and harness can be used consistent with confined space entry requirements.
23. Provisions for odor control are to be furnished. This means that odor control equipment should be installed and capable of working. It will be the decision of the City as to whether or not this equipment should be functional.
24. All equipment is to be labeled.
25. The control room is to be furnished with the following:
  - a. wall mounted desk with lift top
  - b. storage cabinet
  - c. telephone service
  - d. battery operated clock
  - e. fire extinguisher
  - f. sink and hot water
26. In sewer pumping stations, two fully automatic, one half hour Scott air packs with cases mounted on the wall are to be provided.
27. All hardware is to be stainless steel.
28. Two heaters are to be installed in each room. Each heater is to have a separate breaker and a separate thermostat.
29. Hatches and gratings are to be aluminum. Gratings are to be a minimum 1.5 inches thick.
30. Hatch access doors are to be Bilco doors with provisions for padlocks and drains. They are to be equipped with safety chains.

#### F. ELECTRICAL

1. Fans in wet wells, vaults, etc. are to be operated by light switches with manual overrides.
2. A minimum of 6 spare breakers are to be provided.
3. Power outlets are to be provided inside the building.
4. All controls are to be a brand supplied locally.

5. Electric and gas meters are to be located outside of the building.
6. An outside electric outlet is to be provided.
7. A permanent final electrical diagram is to be provided to be kept in the station.
8. The electrical room housing the instrumentation may also house the generator but must be a separate room from the pump room and be gas tight. Separate buildings will be accepted.

#### G. ALARMS

1. A general alarm is to be sent to West Lake Water Treatment Plant.
2. All alarm contacts are to be normally closed.
3. A key operated disalarm intrusion alarm is to be provided.
4. A master switch is to be provided inside the building which will turn off all alarms to West Lake Water Treatment Plant.
5. In a water pumping station, the following alarms are to be provided ( see attached diagram ):
  - a. intrusion alarm with adjustable delay
  - b. fire alarm
  - c. power failure alarm with adjustable delay
  - d. temperature alarm with adjustable high/low
  - e. flooding in building alarm ( flooding or sump pump failure )
  - f. high water alarm which also turns pumps off
  - g. low water alarm which also starts pump
  - h. high system pressure alarm also shuts everything down
6. In a sanitary sewer station, the following alarms are to be provided.:
  - a. intrusion alarm with adjustable delay
  - b. fire alarm
  - c. power failure alarm with adjustable delay

- d. temperature alarm with adjustable high/low
- e. high water alarm which also turns pumps on
- f. low water alarm which also shuts pumps off

#### H. PLUMBING

1. The domestic water meter is to be located inside the building.
2. A backflow prevention valve is to be installed on the domestic water service.
3. Double disc rising stem valves are to be installed in a valve vault. Valves are to open left.
4. Valves are to be Mueller valves meeting AWWA C500 or approved equal.
5. Line valves are to be installed on piping outside the building for water lines and sanitary sewer force mains.
6. All water service pipe is to be copper.
7. A yard hydrant or outside hose bib is to be provided as determined by the City.
8. Water main and force main installations are to be tested at a pressure 100 psi over the normal operating pressure for a period of 6 hours.
9. A flowmeter with appropriate bypass arrangement is to be provided.
10. In water stations, automatic air relief valves are to be installed.
11. In water stations, surge relief valves are to be piped outside the building.
12. A valve is to be installed to each side of a pump.
13. Check valves in sewer stations are to have swing arms.

#### I. RECORDERS/ CHARTS / METERS

1. Running hour meters are to be provided for generators, pumps and chemical feed units.
2. Flow recorders and hour meters should conform to the attached information ( see Appendix ).
3. In a sanitary sewer pumping station, the following are to be provided:
  - a. flow chart - 7 day

- b. totalizer and recorder - to include indicator of instantaneous flow
  - c. a year supply of charts
  - d. pressure gages - no recorders
  - e. every gage is to have a Ray Pressure Snubber Model No. 1
  - f. manual shut off valve before pressure gage
4. For a water station with pumping to atmospheric storage, the following are to be provided:
- a. In the station
    - i. flow totalizer and recorder with an indicator of instantaneous flow
    - ii. flow charts - 7 day
    - iii. year supply of flow charts
    - iv. tank level recorder - 7 day
    - v. pressure gages on suction and discharge lines
    - vi. manual shut off before pressure gage
  - b. at West Lake Treatment Plant
    - i. tank level recorder - 7 day
    - ii. tank level indicator
    - iii. flow rate recorder - totalizer and instantaneous indicator
5. For a water station with a hydropneumatic tank, the following are to be provided:
- a. In the station
    - i. flow totalizer and recorder with indicator of instantaneous flow
    - ii. flow recorder - 7 days
    - iii. year supply of charts
    - iv. pressure recorder - 7 day
    - v. instantaneous pressure reading

b. At West Lake Water Treatment Plant

- i. pressure recorder - 7 day
- ii. instantaneous pressure reading

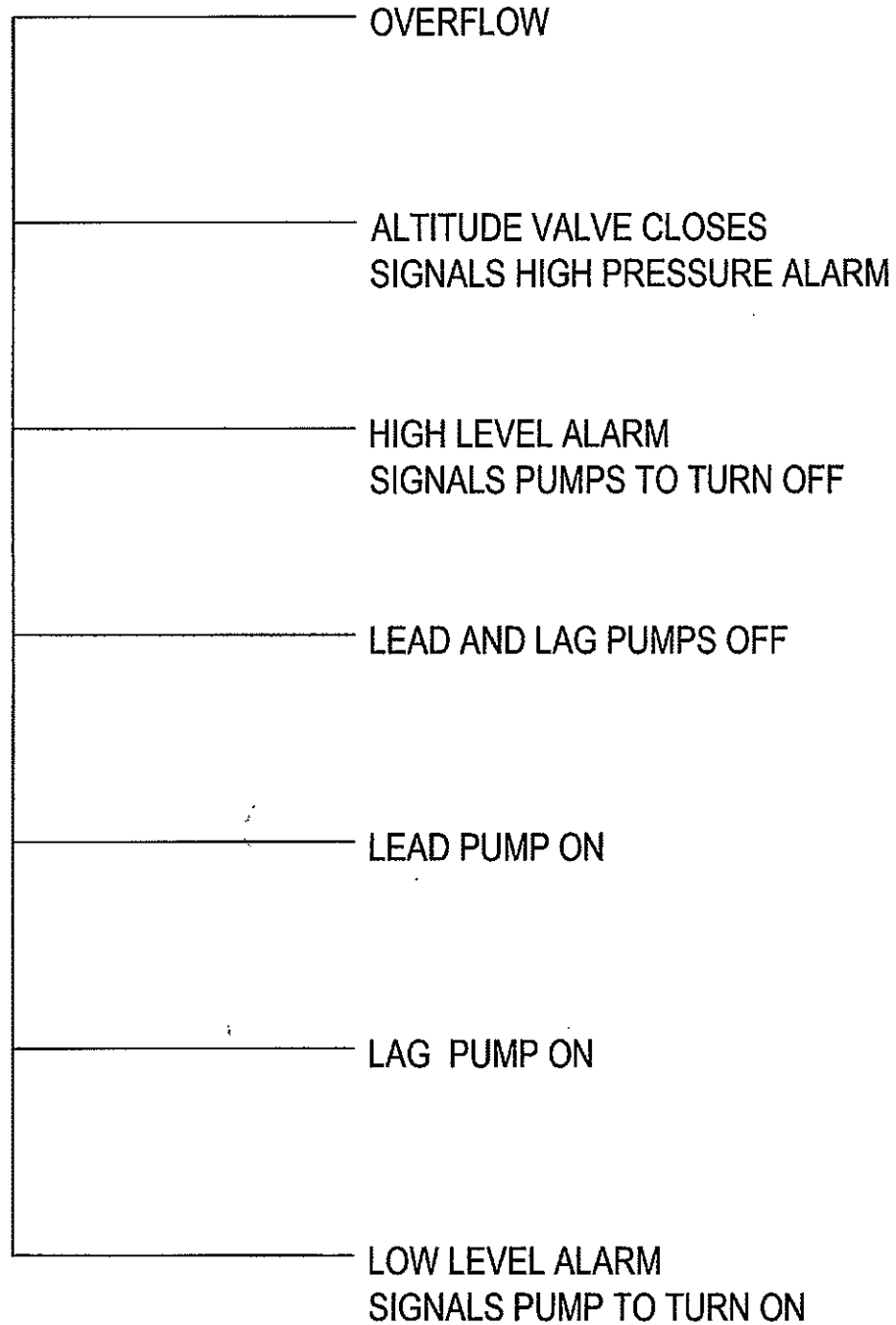
J. VALVE VAULTS /METER PITS

- 1. Vaults and pits are to be insulated.
- 2. They are to be capable of handling H-20 loadings if warranted.
- 3. They are to have positive means of draining. Drains are to be in the floor. Gas traps are to be installed if warranted.
- 4. Access doors are to be Bilco with removable key and drain or approved equal. Manhole frames and covers are not acceptable.
- 5. A power outlet is to be provided.
- 6. A light is to be provided.
- 7. All fixtures and equipment are to be explosion proof.
- 8. Ventilation is to be provided.
- 9. A BIF flowmeter and bypass are to be installed.
- 10. A Dresser adapter is to be installed on one side of the flowmeter for easy removal of the flowmeter.
- 11. Pipes and fittings are to be adequately supported.
- 12. A space heater is to be provided.
- 13. Cast in rungs or an aluminum ladder are to be provided.

5/31/88  
retyped 11/12/96  
revised 5/5/06

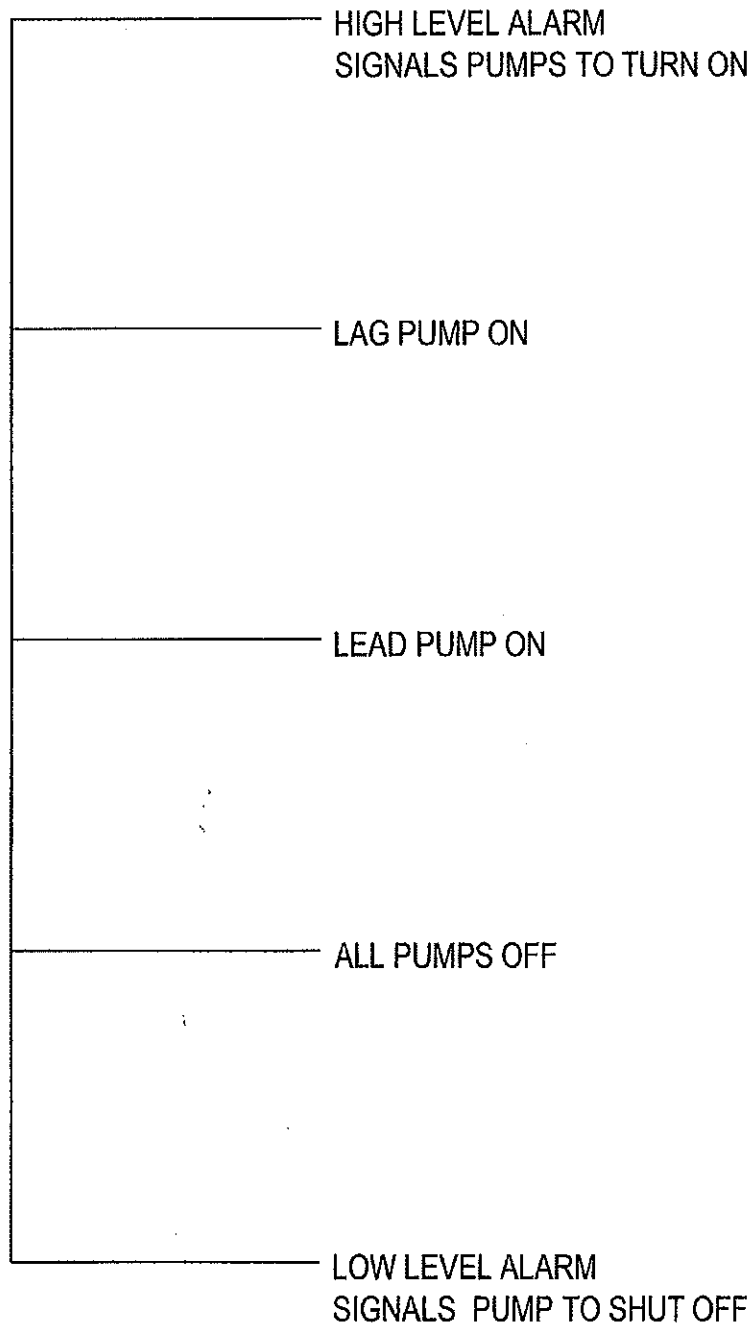
**SUGGESTED SCHEMATIC**  
**ALARMS AND FLOAT SYSTEM**  
**WATER PUMPING STATION**

4/10/2006



**SUGGESTED SCHEMATIC**  
**ALARMS AND FLOAT SYSTEM**  
**SANITARY SEWER PUMPING STATION**

4/10/2006



**APPENDIX D**

**INDEX  
CITY OF DANBURY  
WATER  
SPECIFICATIONS AND DETAILS**

**SPECIFICATIONS**

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**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - DUCTILE IRON PIPE**

May 31, 1988  
Revised July 7, 1989  
Revised September 24, 1996  
Revised November 5, 1996  
Revised July 22, 2004  
Revised April 7, 2006  
Revised February 1, 2007

**PIPE AND FITTINGS / MATERIALS.**

Pipe shall be made of ductile iron. Pipe joints may be either mechanical joint, push-on joint, or restrained joint.

Restrained joint pipe shall be either U.S. Pipe TR-FLEX, Clow Super-Lock, or approved equal. Where restrained joints are warranted, the City will permit the use of the Ebba Iron, Inc. Series 1100 MEGALUG joint restraint for ductile iron mechanical joint pipe and fittings and Ebba Iron, Inc. Series 1700 restraint harness for ductile iron pipe push-on bells all to be installed in conformance with manufacturer's recommendations. Where, on a case by case basis, the City permits the use of concrete thrust blocks to restrain fittings, the concrete thrust blocks are to be sized by an engineer and are to be installed bearing on undisturbed ground.

Ductile iron pipe shall conform in all respects, except for ends, to ANSI A21.51 (AWWA C151), latest editions.

Pipe ends shall conform to ANSI A12.11 (AWWA C111), latest editions.

Pipe thickness class will vary with particular field conditions. Thickness classes are to be approved by the City Engineer. The minimum thickness class accepted by the City is thickness Class 52.

The manufacturer's certifications specified in Sections 51.1.2 and 5.4 of Specification ANSI A21.51 (AWWA C151) shall be furnished for ductile iron pipe. A statement shall also be furnished stating that the coating and lining have been installed in accordance with ANSI A21.4 (AWWA C104).

Fittings shall be ductile iron and shall conform to ANSI A21.10 (AWWA C110) and ANSI A21.11 (AWWA C111), or to ANSI A21.53 (AWWA C153) for compact fittings.

All pipe and fittings shall be furnished with a bituminous sealcoat, standard thickness, cement mortar lining in accordance with ANSI A21.4 (AWWA C104), latest revision, and an exterior bituminous coating. Coating that is damaged during shipment or placement shall be touched up in the field with two (2) coats of an asphaltic coating fully resistant to water and chemicals. Materials used for interior surfaces shall be acceptable for potable drinking water supply.

Bronze wedges shall be furnished and installed on each side of each joint to provide electric continuity.

Each piece of pipe and each fitting shall be plainly marked at the foundry with class number and weight.

Prior to manufacture of restrained joint pipe and fittings, laying schedules shall be submitted by the pipe manufacturer or the engineer to the City Engineer for approval.

### **LAYING DUCTILE IRON PIPE.**

All pipe installation shall conform to AWWA Standard C600, latest revision, unless otherwise modified by the City Engineer.

Ductile iron pipe shall be laid to the lines and grades approved. Where the pipeline crosses existing utilities, a vertical clearance of twelve (12") inches minimum shall be maintained, except for storm and sanitary sewers where eighteen (18") inches minimum shall be maintained. The pipe between bell holes shall bear continuously on a four inch (4") minimum layer of gravel or crushed stone thoroughly compacted. If the contractor excavates below the required limit, the trench bottom shall be brought to the required grade with an approved backfill of gravel or crushed stone.

In laying pipe, the deflections shall be limited to 80% of either the maximum deflection listed in AWWA Standard C600, latest revision or the manufacturer's recommended maximum deflection, whichever is less.

Pipe bedding shall be crushed stone or gravel approved by the Engineering Department of the City of Danbury.

All pipe, fittings and valves shall be lowered carefully into the trench by means of mechanical equipment in such a manner as to prevent them from being damaged. The insides of all bells and outsides of spigots shall be wire brushed and wiped clean and dry and shall be free from oil or grease. During the laying of the pipe, extra care shall be taken to see that no dirt, debris, tools, clothing or other illicit materials are allowed to be left in the pipeline.

After the pipe is laid in the trench, the spigot end shall be centered in the bell and pushed home. Under no circumstances shall pipe be laid where there is water in the trench. The contractor shall install and joint pipe in accordance with the manufacturer's instructions.

Waterstops constructed of suitable dead sand shall be placed at all joints (pipe, fittings and manholes) to a distance of 12" beyond each pipe joint (in both directions). The dead sand is to be placed to the same height as the bedding material.

When necessary to cut pipe in the field, the cutting shall be done such that neither the pipe nor the lining shall be damaged and such that a smooth, right angle to axis cut is made. A machine designed for this purpose shall be used for the cutting. Cut ends and rough edges shall be ground smooth and for push-on joint connections the cut end shall be beveled. Restrained joint pipe is not to be field cut.

## **BACKFILLING.**

Unless otherwise specified or directed, all trenches and excavations shall be backfilled immediately after installation and inspection of the pipe.

Selected material from the excavation shall be used for backfilling trenches along and over the pipe to a level 12" above the top of the pipe and shall be earth, sand, or well graded gravel with a maximum size of 4". The contractor shall store suitable material from excess excavation and from other portions of the work for use as backfill. From a point 12" above the top of the pipe to the top of the trench, backfill shall be carefully deposited in uniform layers not exceeding 6" in depth with stones no larger than 8" in size and, unless otherwise permitted, each layer shall be carefully and solidly compacted with appropriate tools in such a manner as to avoid disturbing the completed work. Compaction testing may be required. Backfill material is to be free of organic matter.

Prior to backfilling the remainder of the trench, a metallic tape shall be installed 12" to 18" below the ground or road surface. The metallic tape shall be as manufactured by Allen Systems, Inc., Wheaton, Illinois, or approved equal. The tape shall be a minimum 3" wide and consist of a minimum thickness .35 mils solid aluminum foil core running the full length and width. The aluminum foil core shall be encased in a protective, high visibility, safety precaution blue inert plastic jacket that is impervious to all known alkalis, acids, chemical reagents, and solvents found in the soil. The requirement for the installation of metallic tape applies to all new mains and services.

Backfilling for the remainder of the trench/excavation shall be approved material free from organic material. No large stones shall be used in the trench until there is at least 1 foot of fill over the pipe or around the structure. In depositing stones, care must be taken not to damage the pipe or structure. Stones which are used in backfilling shall be no greater than 8" in size and so distributed through the mass that all interstices are filled with fine material. Backfill shall be deposited in layers not to exceed 6" in depth and solidly compacted by mechanical means.

Materials and methods related to backfilling shall be in accordance with Connecticut Department of Transportation specifications.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
FIRE HYDRANT ASSEMBLY**

May 6, 2014

**HYDRANT**

Hydrants shall be 5<sup>1</sup>/<sub>4</sub> inch hydrants with two (2) 2<sup>1</sup>/<sub>2</sub> inch hose nozzles and one (1) 4 inch pumper nozzle.

Hydrants shall open left.

Hydrants shall be yellow.

Operating cap nuts shall be pentagonal 1<sup>1</sup>/<sub>2</sub> inch point to flat.

Threading of hose and pumper nozzles shall be "National Standard". The threading for the 4 inch pumper nozzle shall be 4 threads to the inch. The threading for the two (2) 2<sup>1</sup>/<sub>2</sub> inch hose nozzles shall be 8 threads to the inch.

Hydrants are to be furnished with a fully bronzed waterway (bronze to bronze closing) including a bronze seat and a bronze seat ring.

Connection between fire hydrant service and elbow at base of hydrant shall be six inch (6") mechanical joint. Restrained joints are to be provided for the entire fire hydrant service pipe as well as for all valves, fittings and the fire hydrant itself.

The Kennedy K-81D hydrant with Danbury threads and drain holes tapped for standard plugs and the Mueller Centurion Model #A423 Fire Hydrant are the City of Danbury's standards and no substitutions will be allowed.

Hydrant shall rest on a flat stone not less than four inches (4") thick and eighteen inches (18") square and shall be surrounded by ½ cubic yard of screened gravel. The screened gravel shall be covered with an approved filter fabric, felt paper, burlap or canvas and the excavation carefully backfilled.

A concrete thrust block designed by an engineer for the particular field conditions shall be constructed on the main behind the hydrant tee.

A concrete thrust block shall be constructed behind the hydrant. Thrust blocks shall have a minimum bearing surface of four (4) square feet on undisturbed soil. Care shall be taken not to block the hydrant drain holes.

The ground surface shall be three (3") inches below the standpipe breaking ring. Finished grade is to be established at the time the fire hydrant is installed.

No riser sections are allowed on new installations.

Hydrant shall conform to AWWA C502 specifications.

#### HYDRANT VALVE

The 6" gate valve shall be AWWA Standard C500, double-disc, non-rising stem, bronze-mounted, iron body valve or AWWA C509 resilient seated gate valve. The valve will be installed vertically in horizontal pipe line, shall open left (counter clockwise), and shall be furnished with two inch (2") operating nut. No extension stem is required for gate valve.

When using a hydrant tee (mechanical joint tee with a rotatable gland), a mechanical joint valve is acceptable.

See the City of Danbury Standard Specifications for Gate Valves and Resilient-Seated Gate Valves.

#### HYDRANT VALVE BOX

Valve box shall be cast iron slide type with five inch (5") shaft. Cover shall be cast iron and shall have the word "WATER" cast on it. Valve box shall be set carefully, truly vertical and accurately centered over the operating nut with the top set at roadway or existing ground surface grade.

#### USE OF OFFSET FITTINGS

The use of offset fittings to adjust the height of the fire hydrant installation is typically **NOT** allowed on new installations.

Offset fillings will only be allowed to be used to adjust the fire hydrant to finished grade when specifically approved on a case by case basis by the Engineering Department during installation of a fire hydrant assembly.

Offset fittings shall be "Gradelok" or approved equal and shall be manufactured of 350 Ductile Iron, shall be cement lined inside and tar coated outside for corrosion protection, and shall conform to AWWA C153/ANSI A21.53/AWWA C104/ANSI A21.4.

#### WARNING PLATE

A circular warning plate shall be mounted on the pumper outlet of each hydrant at the time of installation. The plate shall read "NO WATER" painted in black letters on a yellow background. The plate shall be fabricated from plywood or other approved material. The plate shall stay on the hydrant until the water main is disinfected, tested, and put into operation.

#### HYDRANT SERVICE

The maximum length (connection at water main to fire hydrant body) of a fire hydrant service is to be fifty (50') feet, however, consideration and possible approval of a deviation from this requirement will be given by the City Engineer on a case by case basis.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - GATE VALVES**

August 31, 1990

Gate valves shall be AWWA Standard C500, double-disc, non-rising stem, bronze mounted, iron body valves. The valves will be installed vertically in horizontal pipelines, shall open left ( counter clockwise ), and shall be furnished with a two inch ( 2" ) operating nut. No extension stem is required for gate valves.

Interior and exterior steel or cast iron surfaces of valves, except finished or bearing surfaces, shall be shop painted with two coats of asphalt varnish in accordance with AWWA Standard C500.

All valves shall be a product of a manufacturer having units of similar type, size, and service requirements successfully operating in municipal water works projects for a period of not less than five ( 5 ) years. The manufacturer, if requested by the Engineer, shall furnish torque design calculations.

The valves shall be AWWA Iron Gate Valves, as manufactured by the Kennedy Valve Manufacturing Company, the Mueller Co., or approved equal.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - RESILIENT-SEATED GATE VALVES  
(Sizes 3" through 12")  
July 11, 2002**

Resilient-seated gate valves shall fully comply with the latest revision of ANSI/AWWA C509, shall be Underwriters Laboratory Inc. listed and shall be approved by Factory Mutual Corp. The valve shall be designed for use in potable water systems and shall be tested and certified to ANSI/NSF 61. The valve type shall be NRS (non-rising stem). The valves will be installed vertically in horizontal pipelines, shall open left (counter clockwise) and shall be furnished with a two-inch (2") square operating nut.

At a minimum, the resilient-seated gate valves shall meet the following provisions:

- The valve shall have a 250 p.s.i. working pressure rating.
- Prior to shipment all valves shall be hydrostatically shell tested at 500 p.s.i. by the manufacturer.
- Valve body, bonnet, stuffing box, wedge and operating nut shall be made of gray iron or ductile iron in compliance with AWWA C509 or shall be made of ductile iron in compliance with AWWA C515 (Standard for Reduced-Wall, Resilient-Seated Gate Valves).
- The iron valve wedge shall be fully encapsulated in nitrile, SBR or EPDM rubber as specified by the manufacturer.
- All bolts, nuts and washers shall be corrosion resistant.
- Valve stem shall be made of high strength bronze or stainless steel with a minimum yield strength of 30,000 p.s.i.
- The NRS stuffing box shall be furnished with triple O-ring stem seals. Valve design shall allow upper stem seals to be replaced with the valve under pressure in the fully open position.
- An arrow shall be cast on the 2" operating nut showing opening direction (open left).
- The valves shall have all internal and external ferrous surfaces coated with a fusion bonded heat cured thermo setting epoxy material meeting *Standard for Protective Epoxy Interior coatings for Valves and Hydrants* AWWA C550 requirements and certified to ANSI/NSF 61.
- Valves shall have mechanical joint ends unless otherwise required or approved by the City of Danbury.

All valves shall be a product of a manufacturer having units of similar type, size, and service requirements successfully operating in municipal water works projects for a period of not less than five (5) years. All valves shall be covered by a manufacturer's 10 year Limited Warranty from the date of purchase by the end user against defects in materials or workmanship.

Valves shall be resilient-seated gate valves as manufactured by Mueller Company - A-2360 series, American Flow Control - Series 2500, American AVK Company - Series 25, or approved equal.

Note:

- Tapping valves shall have an inlet flange conforming to ANSI B16.1 Class 125 for attachment to a tapping sleeve and shall accommodate full-sized shell cutters with ample clearance during tapping operations.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER – BUTTERFLY VALVE**

August 23, 2005

Butterfly valves shall be of the rubber seat, tight-closing type, and shall meet or exceed all strength and performance requirements of AWWA Standard C504, latest revision, for Class 150B.

Valves for ductile iron pipe shall have flanged or mechanical joint ends. Flanged valves are not permitted for underground/buried use. Flanges shall be Standard ANSI B16.1, 125#, complete with full faced  $\frac{1}{16}$ - inch thick rubber gaskets. Flanges shall have square head screws of adequate number and size in order to free the flanges for future removal of the valve. Nuts, bolts, studs and screws for valves shall be stainless steel.

Valves for concrete pipe shall have mechanical couplings of the raised shoulder type, Victaulic Style 44N, or approved equal.

Mechanical joint valves and valve operators shall be suitable for underground service, and shall open left (counter clockwise). Valves shall be furnished with extension stems, two – inch (2") AWWA operating nut and adjustable valve box and cover. Extension stems shall be round and of mild steel and shall be cut to the proper length in the field. Operating nuts shall be set approximately twelve inches (12") below grade and shall be connected to the extension stem by a shear pin rated at 150 ft-lbs torque.

Valves shall be equipped with a mechanical stop-limiting device to prevent the disc from rotating through the opened and closed positions.

Valve shafts shall be stainless steel.

Interior and exterior steel or cast iron surfaces of valves, except finished or bearing surfaces, shall be shop painted with two coats of asphalt varnish in accordance with AWWA Standard C504.

All valves shall be a product of a manufacturer having units of similar type, size and service requirements successfully operating in municipal water works projects for a period of not less than five (5) years. The manufacturer, if requested by the Engineer, shall furnish torque design calculations.

The valve shaft shall be horizontal.

Valves shall be connected to ductile iron pipelines with flanged (not for use underground) or mechanical joint adaptors. Restrained flanged adaptors shall consist of a short length of pipe, flanged at one end and restrained push-on joint on the other, or approved equal. Adaptors which are not restrained shall be Rockwell Type 913, Dresser Style 128, or approved equal. Mechanical joint valves are to be restrained using Meg-A Lugs, where restraint is necessary.

Valves shall be "Groundhog" butterfly valves, as manufactured by Henry Pratt Company, or approved equal.

Butterfly valves, when approved by the Engineer, are to be allowed only on 16 inches and larger water mains.



**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - VALVE BOX**

September 21, 1984  
October 28, 2004  
May 9, 2005

Valve boxes shall be North American manufactured cast iron slide type with five inch (5") shaft. Covers shall be cast iron and shall have the word "WATER" cast on them. Valve boxes shall be set carefully, truly vertical and accurately centered over the operating nut with the top set at roadway or existing ground surface grade.

An acceptable gate valve box is the five and one quarter inch (5<sup>1</sup>/<sub>4</sub>") gate box manufactured by Bibby/McWane Incorporated, or equal.

**CITY OF DANBURY  
DEPARTMENT OF PUBLIC WORKS**

**STANDARD SPECIFICATION  
HAND OPERATED AIR VENT ASSEMBLY**

Air vent fittings shall be 1 inch diameter, as manufactured by Wedge Incorporated, P.O. Box 1995, Bridgeport, Connecticut, or approved equal. Fittings shall be furnished with operating rod, pull lever, and extension piece to discharge above grade.

Valve boxes shall be cast iron slide type with five inch ( 5" ) shaft. Covers shall be cast iron and shall have the word "WATER" cast on them. Valve boxes shall be set carefully, truly vertical and accurately centered over the operating nut with the top set at roadway or existing ground surface grade.

Air vent assemblies shall be installed at the locations and in accordance with the details shown on the plans.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER – FLUSHING WATER MAIN**

April 4, 2006  
Revised January, 2010

The Contractor is to make arrangements with the Engineering Division of the City of Danbury Public Works Department for the Contractor to flush the water system improvements, in conjunction with the disinfection of the new water line. The Engineering Division is to be notified at least 48 hours in advance of any proposed flushing, so that the operation of valves can be scheduled with the Public Utilities Division of the City of Danbury Public Works Department.

Public Utilities Division personnel are the only people allowed to operate valves on the existing City water system. The Contractor is to operate new valves installed on the new water main.

The Contractor is to follow installation procedures, as specified in AWWA C600 Installation of Ductile Iron Water Mains and disinfection procedures, as specified in AWWA C651 Disinfecting Water Main, as well as the City of Danbury standard specification for disinfection of water mains. To facilitate this process, the contractor is to follow proper preventative procedures during construction and is to keep the pipe clean and dry.

The procedure, supervised by the Engineering Division inspector, for flushing and disinfecting is as follows: On day one, the pipeline is flushed, filled with water and disinfected. On day two, the pipeline is dechlorinated and the first set of water samples is collected by the Public Utilities Division. On day three, the Public Utilities Division takes a second set of water samples (24 hours after the first set of water samples are taken). On day four, lab results are reported 24 hours after the second set of water samples were collected. When water samples are determined to have passed the required lab tests, a pressure test of the new water line can be performed.

Flushing of water mains of sand and fines is to be done with all fire hydrants open. Air is to be bled through the air releases and fire hydrants. The Contractor is to verify that the required cleansing velocity (2.5 feet per second) is obtained.

When flushing is completed, the Contractor is to coordinate with the City to have the Public Utilities Division return to the site to close all valves (beginning and end valves are to be closed at the same time).

After disinfection is completed, the Contractor is responsible for the final flushing of the water main to remove the highly chlorinated water. The flushing is to continue until the Contractor has verified that the chlorine concentration in the water is no higher than the chlorine concentration generally found in the City water system (1 mg/l).

The Contractor is to provide all equipment required for flushing, disinfecting and pressure testing. The Contractor is responsible for determining where to drain water so as not to flood or damage property and for making adequate drainage provisions during flushing. The Contractor is responsible for the dechlorination of the pipeline with neutralizing chemicals, as necessary.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - DISINFECTION**

Revised 6/18/99  
Revised 5/5/06  
Revised January, 2010

**WATER MAINS**

Prior to acceptance, the Contractor shall disinfect the pipeline constructed according to the procedures specified under AWWA C601. To facilitate disinfection, the Contractor shall follow proper preventive procedures during construction. The Contractor shall keep the pipeline clean and dry. When pipelaying is not in progress, all openings in the pipeline shall be closed by watertight plugs. The Contractor shall insure that all packing materials and joint sealants are not contaminated. Precautions shall also be taken to protect pipe interiors, fittings, and valves against contamination.

The City of Danbury will supply the services of their chemist to make water analyses. Arrangements for chemist services are to be made through the Engineering Division of the City of Danbury Public Works Department. The contractor/developer will be responsible for the payment to the Public Utilities Division of the City of Danbury Public Works Department for the chemist's services. The Public Utilities Division should be contacted with any questions as to the current rate being charged for these services.

The Contractor shall provide sufficient calcium hypochlorite for disinfection; connections to the pipeline, meter, pumps, corporation stops; electrical power source; and all necessary labor to complete the disinfections of the pipeline.

The calcium hypochlorite used shall contain 70% free chlorine.

The Contractor shall provide access to all parts of the pipeline as required. All necessary connections to the chemical feed pump and pipelines shall be made by the Contractor. Water from the existing pipeline shall be made to flow at a constant measured rate into the new pipeline. At the same time, a chlorine solution shall be fed into the line and proportioned so that the chlorine concentration of the water in the pipe is at a minimum of 50 mg/l available free chlorine. Chlorination shall continue until a 50 mg/l available free chlorine residual is obtained in the entire pipeline. At that time, hydrants and connections shall be operated. The water shall stand in the pipeline for a 24 hour retention period. At the end of the retention period, the heavily chlorinated water shall be flushed from the pipeline. At that time, bacteriological tests shall be taken by the City. If the initial disinfection fails to produce satisfactory samples, the entire disinfection sequence shall be repeated until satisfactory samples are obtained. After approval by the City, the Contractor shall remove all connections, cover all corporation stops and backfill all access areas.

**FIRE LINES**

All ductile iron fire lines (fire only or combined fire and domestic) shall be flushed, disinfected, and sampled. Samples must pass water quality testing prior to the pressure test.

A service saddle with wedge blow-off or other means for disinfection is to be installed after the new valve for chlorination purposes.

The City of Danbury Building Department is responsible for approving the fire line installation (includes confirming fire line disinfection and pressure testing).

If a lab other than the Public Utilities Division of the City of Danbury Department of Public Works is used to collect water quality samples from new lines and analyze them, the lab must be State certified and AWWA standards must be met. The Public Utilities Division must be copied on lab results prepared by others.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER - PRESSURE TESTING**

October 23, 1984  
Rev. August 22, 2005

The pipeline, including valves, fittings and hydrants, shall be given a hydrostatic test at a pressure equivalent to one hundred ( 100 ) pounds per square inch over the normal operating pressure for the area. This test pressure shall be maintained for a least six ( 6 ) hours, during which time the leakage under this test shall not exceed the testing allowance defined in AWWA C600 (latest edition).

Prior to making the test, the Contractor shall submit a schedule of the testing procedure for approval, with a description of methods and equipment proposed to be used.

All visible leaks shall be made tight regardless of the amount of leakage. If the line does not meet the requirements of the above leakage test, it shall be repaired and retested until the leakage requirement is met. The Contractor shall furnish all labor, equipment and materials for testing. All valves and connections shall be made tight and shall operate properly before the work is accepted. All defective work shall be repaired or replaced at the expense of the Contractor.

The above hydrostatic tests shall be conducted in the presence of the City representative.

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
WATER – EPOXY COATED TAPPING SLEEVES  
AWWA C-223**

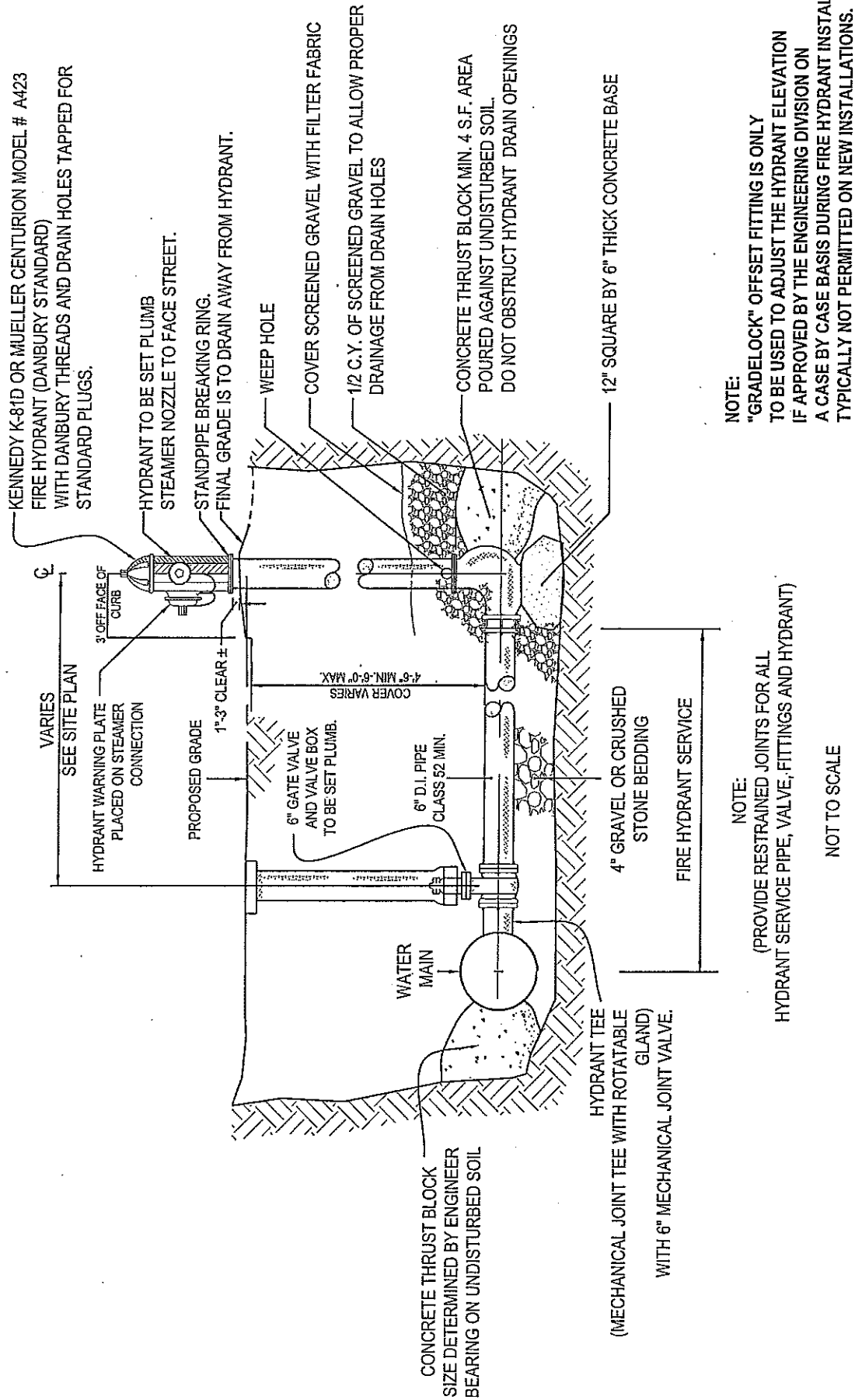
May 2, 2006  
Revised January, 2010

Tapping sleeves are to be full saddle ductile iron, stainless steel, or epoxy coated steel. Tapping sleeves shall be as manufactured by Smith-Blair, Inc. (Model 622, 622-665), JCM Industries, Inc. (Model 412 and 432), Ford Meter Box (Type FTSS, FTS Steel, or FTSC epoxy coated steel), or approved equal. The flange shall be manufactured to AWWA C207 standards. The body is to be manufactured to AWWA C200 standards complete with a full-faced 1/8 inch thick rubber gasket. The interior and exterior shall be epoxy coated or be all stainless steel.

To tap asbestos cement water lines and for size-on-size taps, tapping sleeves must have a full circumferential 360° gasket and be all stainless steel body and flange conforming to AWWA C220 standards for stainless steel sleeves. Stainless steel sleeves for these applications are to be JCM Model 432, Smith Blair Models 663 and 665, Ford FAST style, or approved equal.

The City of Danbury requires that the contractor schedule the Engineering Division of the City of Danbury Public Works Department inspector to be present for the hydrostatic test of the sleeve and for the tap. Sleeves are to be installed as per the manufacturer's recommendations. Size on size cutters are not to be larger than the pipe manufacturer's recommendations. Sleeve products are to be visually inspected for defects and gasket integrity. Installation instructions for the tapping sleeve are to be available on-site.

Tapping sleeves are to be rated for a minimum design working water pressure of at least 200 psi AWWA service. Once installed, the tapping sleeve is to be pressure tested hydrostatically (not with air) at 1.5 times the static pressure in the main, for 5 minutes, with no drop in pressure. Taps are to be performed by competent, experienced and properly licensed personnel. The cut coupon from the tap is to be saved for the Engineering Division inspector to deliver to the Public Utilities Division of the City of Danbury Public Works Department, when desired.



REVISIONS	
No.	DATE COMMENTS
1	4/2/12
2	4/15/13 AVK REMOVED

CITY OF DANBURY  
 ENGINEERING  
 DIVISION

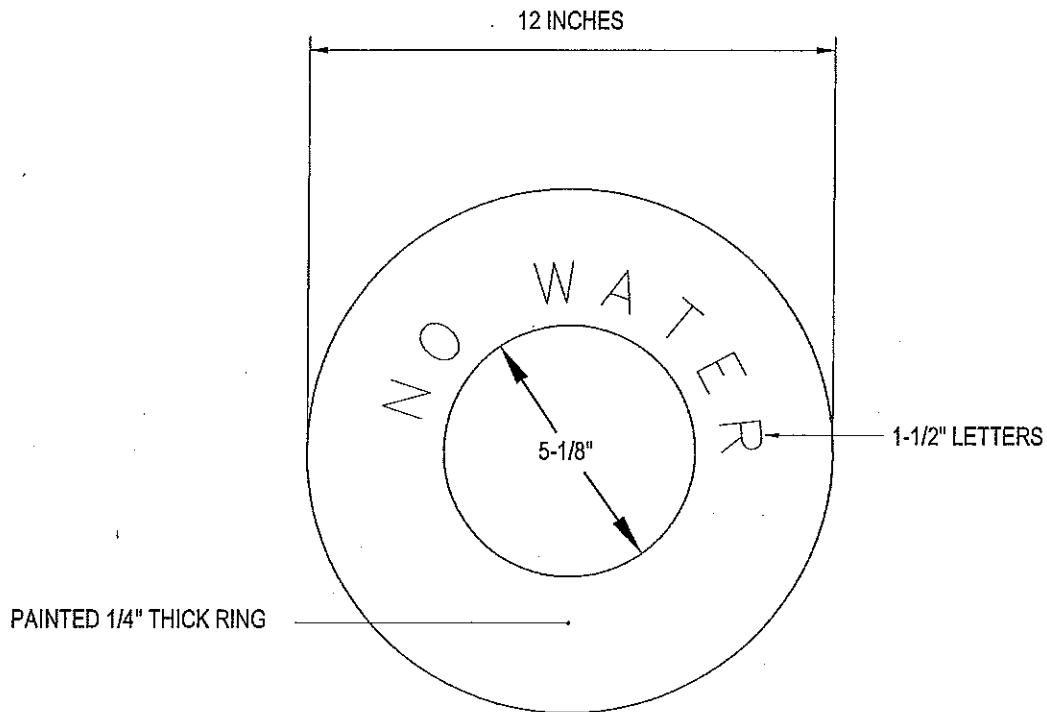
# WATER FIRE HYDRANT ASSEMBLY DETAIL

WATER

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.





NOT TO SCALE

TO BE PLACED ON 4" STEAMER CONNECTION

WARNING PLATES WILL BE REQUIRED IMMEDIATELY AFTER INSTALLATION AND ARE TO REMAIN ON THE NEW HYDRANTS UNTIL AFTER THE PRESSURE TEST HAS PASSED AND THE WATER MAIN HAS BEEN OPENED UP BY THE CITY OF DANBURY PUBLIC UTILITIES DIVISION

#### REVISIONS

No.	DATE	COMMENTS
1	4/2/12	

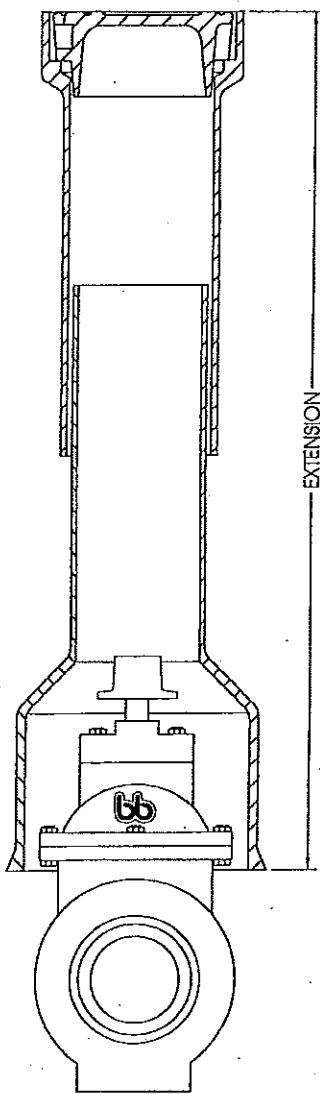
CITY OF DANBURY  
ENGINEERING  
DIVISION

WATER  
HYDRANT WARNING PLATE

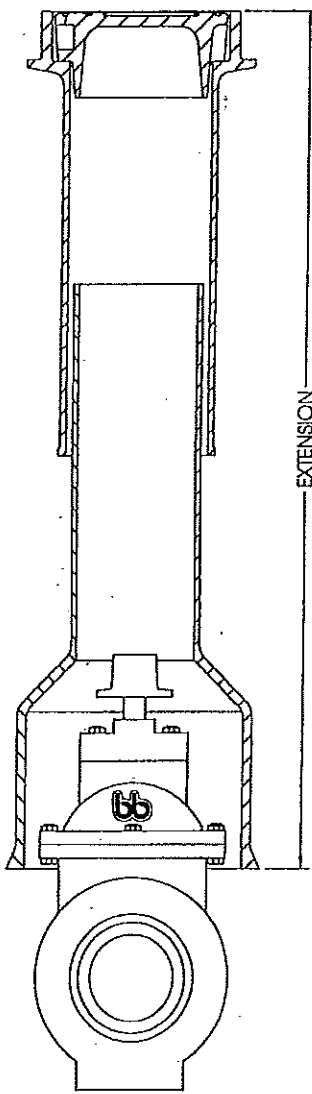
DETAIL

CHECKED BY: D.W.N.

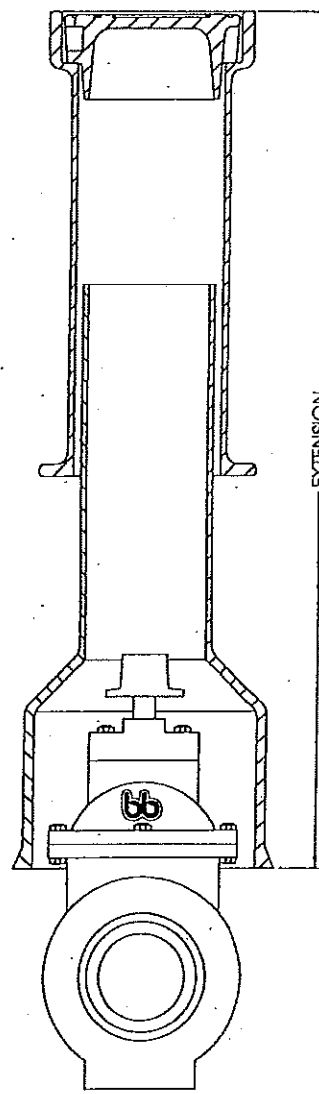
DRAWN BY: P.J.T.

2PC SLIDE STYLE  
NO FLANGE

\*VALVE NOT INCLUDED

2PC SLIDE STYLE  
TOP FLANGE

\*VALVE NOT INCLUDED

2PC SLIDE STYLE  
BOTTOM FLANGE

\*VALVE NOT INCLUDED

VALVE BOX COMPLETE

CODE	EXTENSION (IN.)	Weight (Lb)	FIG. #
V672	18 - 22	61	5560S
V673	26 - 36	76	5562S
V676	38 - 48	86	5564S
V679	32 - 52	96	5562S
V682	38 - 58	101	5564S
V685	52 - 72	109	5566S
V688	62 - 82	117	5568S

VALVE BOX COMPLETE

CODE	EXTENSION (IN.)	Weight (Lb)	FIG. #
V674	18 - 22	76	5560S
V674	26 - 36	81	5562S
V677	38 - 48	87	5564S
V680	32 - 52	93	5562S
V683	38 - 58	100	5564S
V686	52 - 72	109	5566S
V689	62 - 82	116	5568S

VALVE BOX COMPLETE

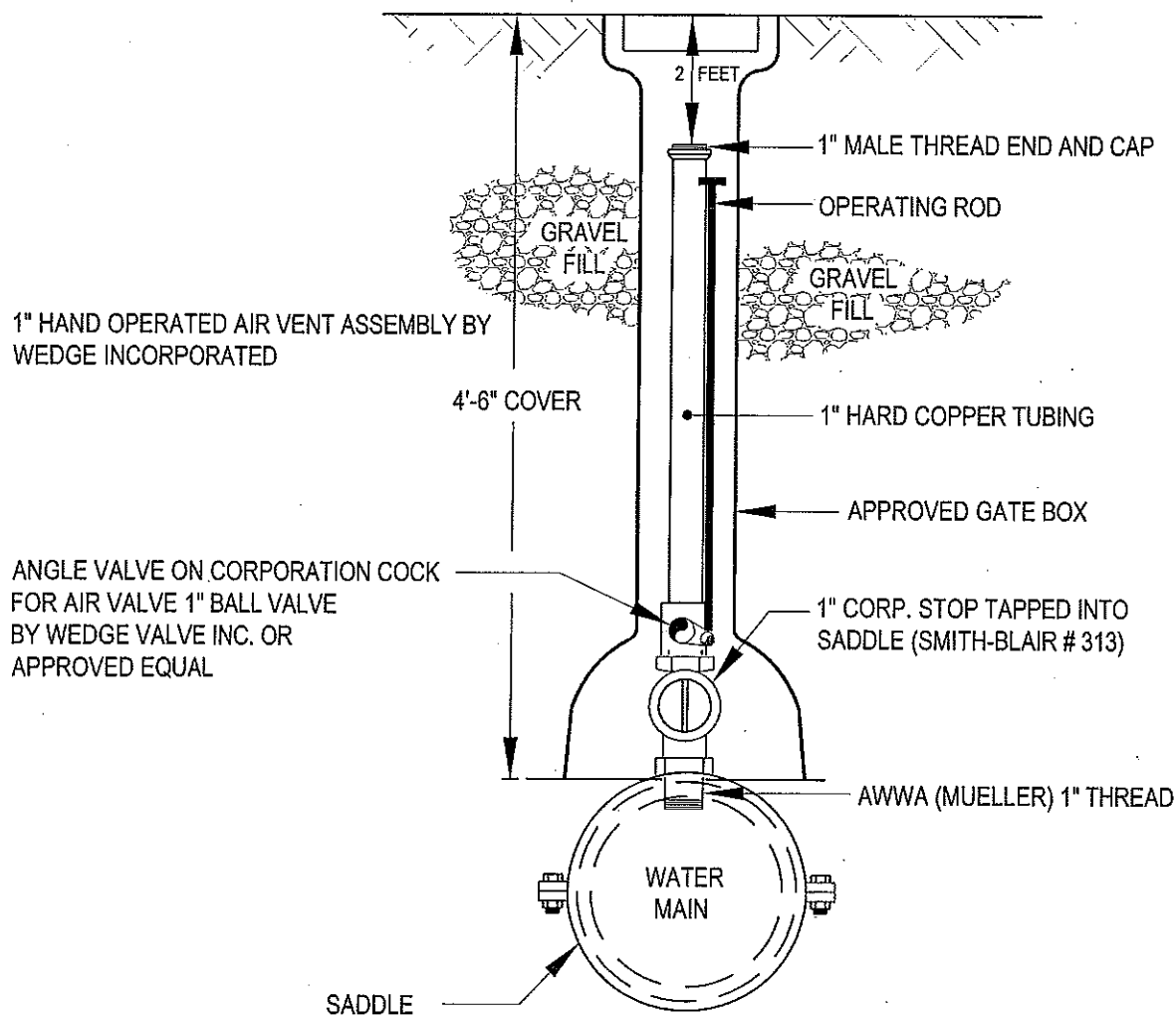
CODE	EXTENSION (IN.)	Weight (Lb)	FIG. #
V675	26 - 36	81	5562S
V678	38 - 48	91	5564S
V681	32 - 52	95	5562S
V684	38 - 58	100	5564S
V687	52 - 72	109	5566S
V690	62 - 82	115	5568S

NOTE: "WATER" COVER SHIPPED UNLESS OTHER SPECIFIED.

# BIBBY STE-CROIX

## U S A

Division of McWane Inc.



- STAINLESS STEEL AIR VALVES SHALL BE USED IN AREAS SUBJECT TO ATMOSPHERIC EXPOSURE OR IN AREAS LIKELY TO BE SUBJECT TO EXPOSURE TO INCREASED ROAD SALT RUN OFF, SUCH AS BRIDGE CROSSINGS.
- ANGLE VALVE TO BE REMOVED AFTER PRESSURE TEST AND CAPPED OVER CORPORATION.

(NOT TO SCALE)

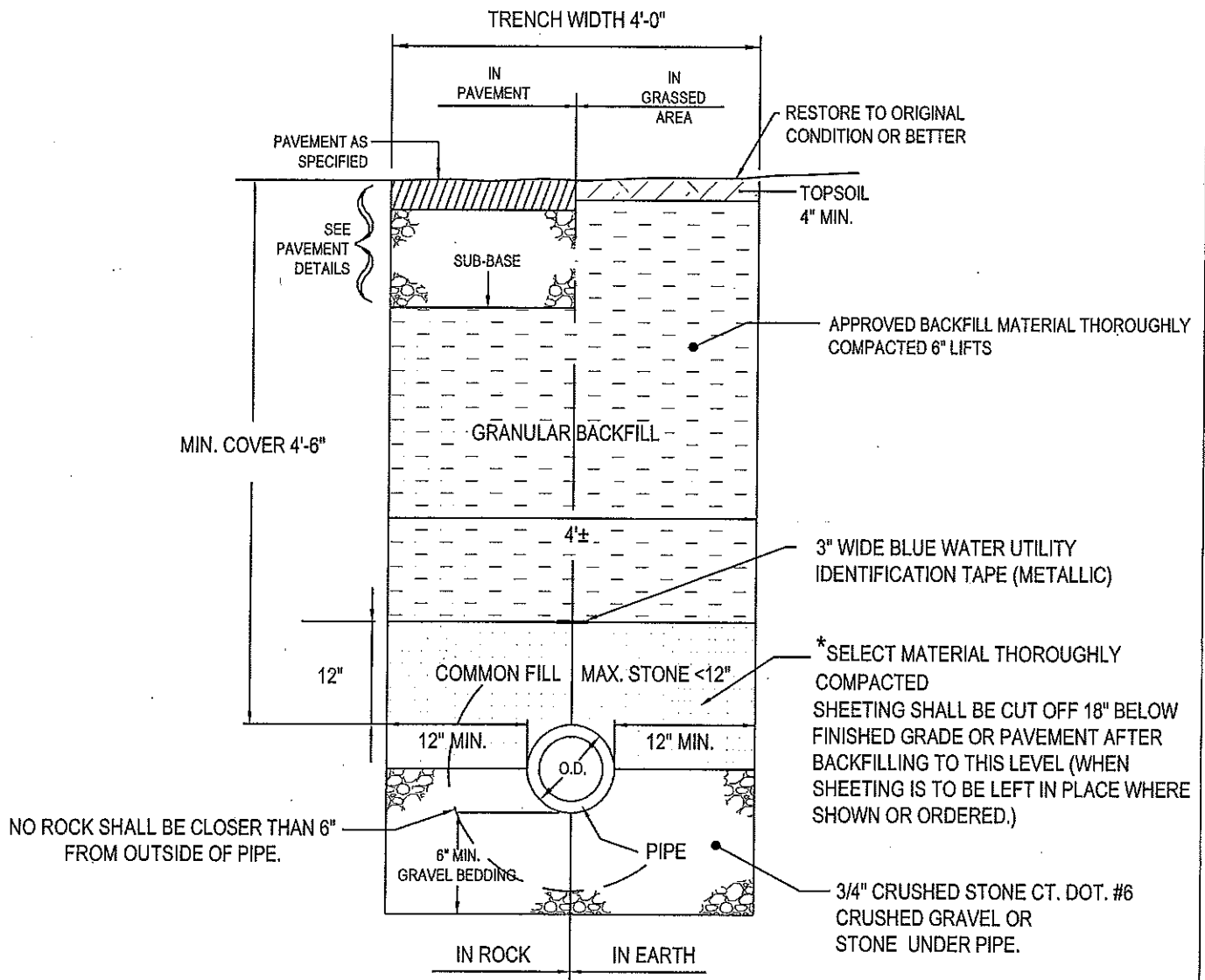
REVISIONS		
No.	DATE	COMMENTS
	4/2/12	

CITY OF DANBURY  
ENGINEERING  
DIVISION

WATER  
AIR RELEASE/TEMPORARY  
CHLORINATION VALVE  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.



**TYPICAL DETAIL  
WATER MAIN TRENCH**

(NOT TO SCALE)

**\*NOTE:**

A WATERSTOP OF DEAD SAND SHALL BE PLACED AT ALL JOINTS AND FITTINGS TO A DISTANCE OF TWELVE (12) INCHES BEYOND EACH JOINT (IN BOTH DIRECTIONS). THE DEAD SAND IS TO BE PLACED TO THE SAME HEIGHT AS THE GRAVEL OR STONE BEDDING PLACED BETWEEN WATERSTOPS.

**REVISIONS**

No.	DATE	COMMENTS
1	4/2/12	

**CITY OF DANBURY  
ENGINEERING  
DIVISION**

**WATER  
WATER MAIN TRENCH  
DETAIL**

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

P OR R.O.W.

INSPECTED BY CITY ENGINEERING DIVISION

INSPECTED BY CITY BUILDING INSPECTOR

CONNECTION TO WATER MAIN. INSTALLATION OF WATER SERVICE AND CONNECTION TO CURB BOX IS TO BE INSPECTED BY CITY ENGINEERING INSPECTOR.

1" MIN.

STREET

WALK

6 FOOT MIN. TRENCH

GOOSENECK (PROVIDE BEND AS SHOWN)

1" TYPE K COPPER PIPE

42" MIN. COVER

EPOXY COATED DOUBLE STRAP BRONZE SERVICE SADDLE ON DUCTILE IRON PIPE

CORPORATION STOP INTO SADDLE

TO BUILDING

CURB STOP

BUILDING

CORPORATION STOP/WASTE COCK

TEMPORARY SPACER BAR BY PLUMBER

WATER METER INSTALLED BY PUBLIC UTILITIES

FULL PORT BALL VALVES

# TYPICAL WATER SERVICE TAP - CONNECTION UP TO 2" SERVICE

NOT TO SCALE

## REVISIONS

No.	DATE	COMMENTS
1	4/2/12	NOTES
2	1/24/13	BALL VALVES

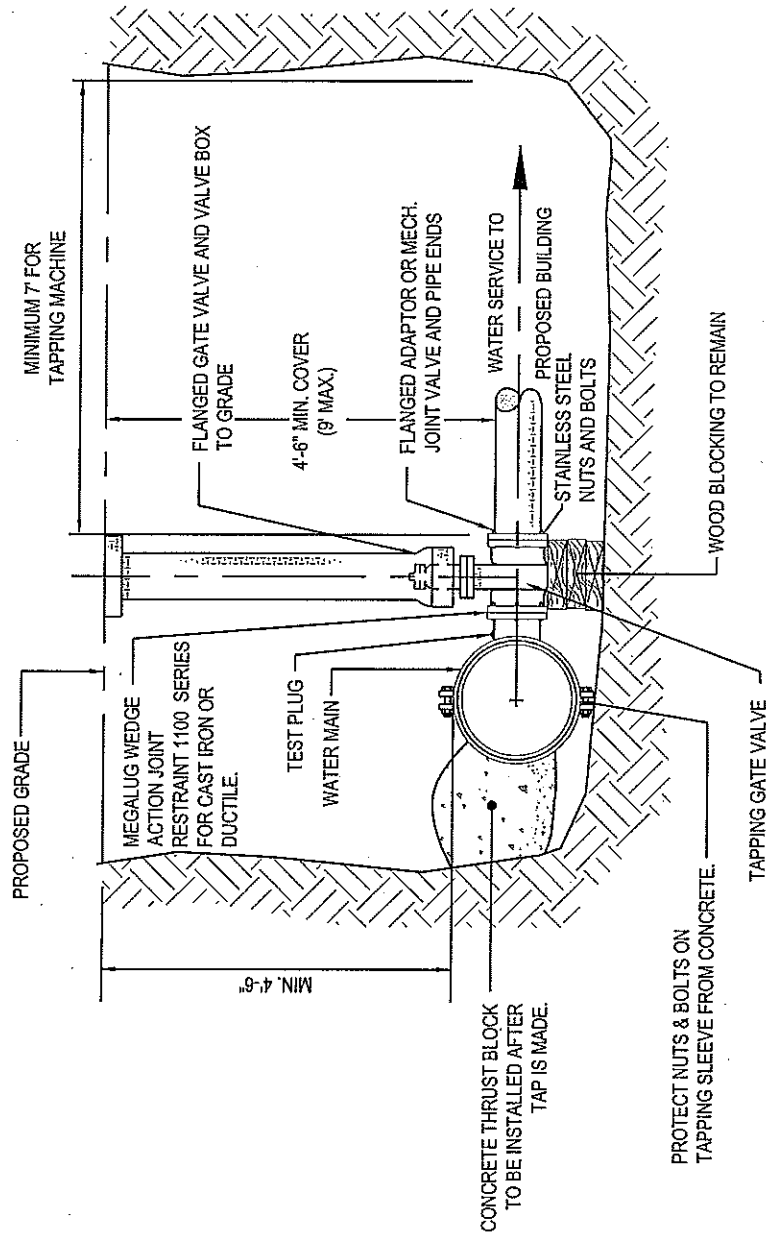
CITY OF DANBURY  
ENGINEERING  
DIVISION

WATER  
TYPICAL WATER SERVICE TAP  
&  
CONNECTION UP TO 2"  
DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

ALL GATE BOXES TO BE PLUMB IN ALL DIRECTIONS



GENERAL CONSTRUCTION NOTES:

- THE TRENCH IS TO BE DEWATERED AND IN COMPLIANCE WITH OSHA REQUIREMENTS FOR TRENCH EXCAVATION. THE WET TAP TO BE PERFORMED BY A CONTRACTOR APPROVED BY THE CITY FOR THIS PURPOSE.
- TAPPING SLEEVE & TAPPING GATE VALVE TO BE INSTALLED ON WATER MAIN. A HYDROSTATIC PRESSURE TEST WILL BE PERFORMED THROUGH THE TEST PLUG WITH INSPECTOR PRESENT. A WET TAP WILL BE PERFORMED ONLY AFTER TAPPING SLEEVE TEST PRESSURE HAS PASSED.
- TAPPING GATE VALVE IS TO OPEN LEFT AND BE MECHANICAL JOINT TO FLANGE MATCHING TAP MACHINE.

REVISIONS

No.	DATE	COMMENTS
1	4/2/12	

CITY OF DANBURY  
ENGINEERING  
DIVISION

WATER

TYPICAL 4" THROUGH 12" WATER SERVICE TAP  
ON MAIN AND TAPPING GATE VALVE DETAIL

CHECKED BY: D.W.N.

DRAWN BY: P.J.T.

**APPENDIX E**

**CITY OF DANBURY  
WATER DEPARTMENT  
RULES AND REGULATIONS**



## **RULES AND REGULATIONS**

### **CITY OF DANBURY WATER DEPARTMENT**

**September 29, 1987**



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## **RULES & REGULATIONS**

### **CITY OF DANBURY WATER DEPARTMENT**

The following rules and regulations are part of the contract between the City of Danbury Water Department and its customers:

**A. DEFINITIONS** - (In all definitions, the interpretation of the City shall govern):

- 1) City - the City of Danbury Water Department.
- 2) Customer - any person, firm, corporation, company, association, governmental unit being the owner of property furnished water service by the City.
- 3) Premises - shall include but is not restricted to the following:
  - a) a building or combination of buildings leased or owned by one customer, in a common enclosure, occupied by one family as a residence or one corporation or firm as a place of business, or
  - b) a building owned or leased by one customer having a number of apartments, offices, or lofts which are rented to tenants using in common one hall and one or more means of entrance, or
  - c) a building two (2) or more stories high under one roof owned or leased by one customer and having an individual entrance for the ground floor occupants and one for the occupants of the upper floors, or
  - d) a combination of buildings owned by one customer, in one

common enclosure, none of the individual buildings which is adopted to separate ownership, or

- e) a public building, or
  - f) a single plat, used as a park or recreational area, or
  - g) an individually owned unit that is part of a building complex.
- 4) Meter - any device for measuring the quantity of water used as a basis for determining charges for water service to the customer. This would include the remote reading device and wire.
  - 5) Property - all facilities owned and operated by the City.
  - 6) Main - a water pipe owned, operated, maintained by the City which is used for the purpose of transmission or distribution of water but is not a service pipe.
  - 7) Tap - the fitting installed at the main to which the service pipe is connected.
  - 8) Service Pipe - the pipe that runs between the main and the customer's place of consumption including fire lines.
  - 9) Service Connection - that portion of the service pipe from the main to and including the curb stop.
  - 10) Customer Service Line - the portion of the service pipe from the curb stop to the customer's place of consumption. Where no curb stop exists, the customer's service line shall be the entire service pipe.
  - 11) Fire Service Line - a service pipe used exclusively for fire protection purposes.
  - 12) Combination Service Line - a service pipe used for both fire protection and domestic, commercial or industrial use.
  - 13) Code of Ordinances - current Code of Ordinances of the

City of Danbury.

- 14) Water Main Extensions - a water main and/or related water facilities that are constructed in an area where no service or inadequate service exists but shall not include water system improvements made by the Department of Public Utilities.

B. APPLICATION FOR SERVICES:

- 1) Application for water service shall be made by each property owner on forms furnished by the City in accordance with the provisions of section J-3g.
- 2) Resumption of water service from a tap or service connection which has been discontinued requires a new application.
- 3) No application for water service will be approved from a property owner having delinquent water and/or sanitary sewer accounts.
- 4) Applications for replacement connections will be governed by the provisions of section J-3e.
- 5) No application for water service will be approved for a property which requires a water main extension unless and until all requirements of the Danbury Code of Ordinances and the water main extension approval process are met. Reference is made to Section W of these regulations.
- 6) After the application for water service is approved by the City, the appropriate connection charge is to be paid by all new customers regardless of whether service is rendered through a simple connection or as a result of a water main extension. Reference is made to section 21.48 of the Danbury Code of Ordinances.

C. LIABILITY FOR CHARGES: The property owner shall be liable for all charges for water service unfit the service has been discontinued to the City's satisfaction pursuant to a written request from the property owner. Service will be discontinued in accordance with section J-2.

D. DENIAL OR DISCONTINUANCE OF SERVICE: The City reserves the right to deny or discontinue service of a customer for the following reasons:

- 1) Tampering with a water meter or the equipment furnished and owned by the City.
- 2) Failure to permit the City reasonable access to meters and related equipment.
- 3) Nonpayment of a water and/or sanitary sewer bill provided the City shall have made a reasonable attempt to effect collection.
- 4) Failure to furnish such service, equipment, permits, certificates or right of way as shall have been specified by the City as a condition of obtaining service, or if such equipment or permission is withdrawn or terminated.
- 5) A condition determined by the City to be hazardous.
- 6) Use by the customer of equipment in such a manner as to adversely affect the City's equipment or the City's service to others.
- 7) When the City has discovered that by fraudulent means a customer has obtained water service or has diverted the water service to unauthorized use or has obtained water service without same being properly registered upon the water meter.
- 8) When the water is used for a purpose not described in the application and/or permit.

- 9) Failure of the customer to fulfill the contractual obligations for service or facilities.
- 10) Violation or non-compliance with the rules and regulations of the City.
- 11) For failure to comply with the water main extension approval process when required.
- 12) The method and manner of termination of service in cases involving non-payment of a delinquent account shall conform to the requirements of Section 16-3-100 of the Regulations of Connecticut State Agencies as the same may be amended from time to time. The provisions of said section relating to termination of service for non-payment of a delinquent account are therefore incorporated herein by reference and made a part hereof as if they had been set forth fully herein.

E. TEMPORARY SERVICE

- 1) When the City renders temporary or intermittent service to a customer it will require that the customer bear all cost of installing and removing the temporary facilities including any metering device.
- 2) The charge for water service for temporary or intermittent service shall not be less than the applicable minimum charge for a period of not less than twelve (12) months.

F. METERED SERVICE:

- 1) Obligatory Meter Service - Metered services are obligatory for all customers except as specified under section G.
- 2) Charges - There is a minimum charge for water service which is

determined by the size of the meter and includes a specific water usage allowance. The water use in excess of the minimum allowed is charged in accordance with the scheduled rates published in the Code of Ordinances. All metered water whether used or wasted, shall be paid for by the customer.

3) Installation of meters –

- a) Water meters one (1) inch in size and smaller are the property of the City and will be furnished and installed without charge to the customer except for temporary or intermittent service which is covered under Section E.
- b) Water meters greater than one (1) inch in size installed after (date) shall become the property of the City and will be furnished and installed by the customer at no cost to the City.
- c) Water meters greater than one (1) inch in size installed prior to (date) will remain the property of the customer until such time as the customer complies with section F-8.
- d) The customer is responsible for providing all other piping and appurtenances and for having them properly installed and ready to receive the meter, including, but not limited to the provisions of sections F-3(h) and F-3(i).
- e) Separate buildings will be metered separately and billed separately.
- f) The City will not permit more than one (1) meter per building for the purpose of measurement of domestic water for billing purposes.
- g) Meter vaults and pits are the property of the customer and the customer is responsible for their installation, maintenance



and repair as necessary and as required by the City. Meter vaults and pits shall remain free of standing water and plans must be approved by the City prior to installation.

h) For meters one and a half (1-1/2) inches in size and larger, a one and a half (1-1/2) inch test tee and an appropriately sized meter strainer shall be installed.

i) Isolation valves shall be installed on the inlet and outlet sides of the meter set in accordance with the specifications of the City. The inlet valve referred to herein may be the same valve noted under Section J-4-e of these Rules and Regulations.

4) Location of Meters -

a. The meter, wire, and remote device locations shall be approved by the City.

b) Meters shall be installed indoors whenever possible in a location provided by the customer.

c) When the premises is supplied by a service pipe that is judged by the City to be unusually long, an outside meter setting will be required to be furnished by the customer.

d) If the City determines that alteration or obstructions have rendered a meter inaccessible or inadequately protected, it will require that such a meter be made accessible and/or be adequately protected at the customer's expense.

e) Meters shall be accompanied by the appropriate remote reading device when specified by the City.

5) Maintenance of Meters - All meters one (1) inch and smaller in size will be maintained by the City at no cost to the customer. Meters larger than one (1) inch in size which are owned by the City will be maintained by the City at the City's expense. Meters larger

than one (1) inch in size which are owned by the customer will be maintained by the City at the customer's expense. Damage to all meters due to freezing, hot water, or external causes shall be paid for by the customer and the customer shall be liable to the City for all damage to said meter which results from the customer's negligence.

6) Accuracy of Meters.

- a. All meters will be tested for accuracy before installation and periodically thereafter. No meter will be placed or kept in service unless it registers within the limits of accuracy specified by the State of Connecticut Department of Public Utilities Control.
- b) The City will, upon written request of a customer, test a meter for accuracy at the customer's premises. The test shall be performed at the customer's expense. The City will furnish a written report of the test to the customer. In the event the results of the meter test demonstrate that the meter is not registering accurately and falls outside the limits set by the State of Connecticut Department of Public Utilities Control, there will be no charge applied for that particular test.
- c) All meters one (1) inch in size and smaller shall be tested by the City at no cost to the customer on a frequency specified by the Department of Public Utilities Control.
- d) All meters larger than one (1) inch shall be tested by the City on a frequency specified by the State of Connecticut Department of Public Utilities Control. If the meter is owned by the City, the test will be performed at the City's expense. If the customer owns the meter, the test will be performed at the

customer's expense.

- e) The provisions of this section do not apply to fire service line meters.
- 7) Tampering With Meters - Meters shall not be opened, removed or interfered with in any way. In all cases where it has been determined by the Public Utilities Department that a meter has been tampered with, the Superintendent of Public Utilities shall have the authority to estimate the quantity of water consumed for which the consumer has not been billed as the result of such tampering and to charge the consumer for this estimated quantity at metered rates. All costs to repair a meter which has been tampered with shall be paid to the City of Danbury by the property owner.
- 8) Size and Type of Meter -
  - a) The size and type of the meter shall be approved by the City based on information furnished by the customer.
  - b) Meters are to be Neptune ARB (Automatic Reading and Billing) unless otherwise approved by the City.
  - c) All meters shall read in gallons.

**G. FLAT RATE SERVICE:**

- 1) Flat rate service is available only when, in the opinion of the City, metered service is not applicable.
- 2) Upon written notification from the City, a customer is required to change from flat rate service to metered service.
- 3) Establishment of the Rate - The flat rate is established in the Code of Ordinances for each specific group of fixtures. Fixture charges are established in the Code of Ordinances.
- 4) Limits on Water Use - A flat rate customer is required:

- a) To notify the City prior to making any change in fixtures or use. Consequent modifications in the rate, if any, will be prorated from the date of change. No fixture will be considered as discontinued until it has been disconnected, removed, and inspected by the City.
- b) Not to run water to prevent pipes or fixtures from freezing.
- c) To maintain their plumbing and service line in good repair and to make repairs properly and promptly.
- d) Not to waste water.
- e) Not to use water for watering lawns or gardens nor for washing vehicles.

H. BILLING AND PAYMENT:

- 1) Bills shall be rendered to each customer quarterly.
- 2) Payments - All bills are payable within thirty (30) days of date rendered. The City may discontinue service after due notice to the customer until the bill is paid. Where it is necessary for the City to excavate in order to discontinue service to a delinquent customer, the delinquent bill and disconnection charge based upon the cost of the work, must be paid before the service is restored. Restoration of service shall be accomplished in accordance with Section B of these Rules and Regulations.
- 3) Customer Deposit - The City may require from any customer or prospective customer a deposit to guarantee payment for bills. Such deposit shall be based on an amount equivalent to the estimated maximum bill for a one (1) year period.
- 4) Adjustments of Bills - Bills which are incorrect due to meter or

billing errors shall be adjusted as follows:

- a) Whenever a meter in service is tested and found to have over-registered more than two percent (2%) the City shall adjust the customer's bill for the excess amount paid as determined below:
  - i) If the time at which the error first developed or occurred can be definitely determined, the amount overcharged will be based thereon.
  - ii) If the time for which the error first developed or occurred cannot be definitely determined, it will be assumed that the over-registering existed for a period equal to one half ( $1/2$ ) of the time since the meter was last tested. If more than one (1) customer received service through the fast meter during the period for which the refund is due, the refund will be paid to the present customer only for the time during which he received service through the meter.
- b) Whenever a meter in service is found not to register, the City shall render an estimated bill. The City shall estimate the charge for water used by averaging the amount registered over the four (4) quarters preceding the period of non-registration adjusting for any changes in the customer's usage. When it is found that the error in the meter is due to some cause, the date for which can be fixed, the overcharge or the undercharge shall be computed back to, but not beyond, such date.
- c) Billing adjustments due to fast meters shall be calculated on the basis that the meter is one hundred percent (100%) accurate for all flow rates. For the purpose of billing adjustment, the meter error in terms of percent will be one half ( $1/2$ ) of the algebraic sum of the percent error at maximum test plus percent error at

intermediate test flow. This meter error is multiplied by the usage in question and the customer's bill will be adjusted in compliance with Section H-4a of these Rules and Regulations.

d) When a custom has been overcharged as a result of an incorrect reading of the meter, incorrect calculation of the bill or other reason, the amount of the overcharge shall be adjusted, refunded, or credited to the customer.

e) When a customer has been undercharged as , result of an incorrect reading of the meter, incorrect calculation of the bill, or other similar reason, the amount of the undercharge shall be billed to the customer.

I. ACCESS TO CUSTOMER'S PROPERTY:

- 1) The City has the right of access to the customer's premises to read, inspect, repair, replace, or service meters and accessory equipment. The customer agrees to grant permission for such access by properly identified employees of the City.
- 2) If a City representative cannot gain access to a premises to read a meter, the water charge for the current bill will be estimated.

J. SERVICE PIPE:

- 1) New Taps – All new taps will be made by the customer at the customer's expense. The City will determine the size on the basis of information furnished by the customer
- 2) Tap Shut Offs - When a premises is to be abandoned or demolished or a service pipe is to be abandoned, the property owner agrees to request permission in writing to close the tap and physically disconnect the service pipe from the tap. All cost incurred in making the tap shut off shall be borne by the customer.

3) Service Connections:

- a) The property owner will furnish materials, install, own and maintain all service connections.
- b) The customer shall pay the full cost of the new service connection including all excavation, backfill, removal, and replacement of paving, walks, curbs, piping, taps, valves, curb boxes, etc.
- c) All excavation, backfill, removal and replacement of paving, walks, curbs, etc. shall be done in accordance with the City specifications and in conformity with all applicable State and municipal regulations.
- d) Service connections installed prior to the effective date of this regulation will remain the property of and be maintained by the customer.
- e) Replacements - The determination of a necessity to replace a service connection will in all cases be made by the City. Such replacement will be furnished, installed, owned and maintained by the customer at his expense including the cost of excavation, backfill, removal and replacement of paving, walks, curbs, piping, taps, valves, etc.
- f) When a request is made to increase the size of an existing service connection, such a request shall be governed by the provisions of Section J-1 and Section J-3 (a through c). The existing tap shall be shut off in accordance with provisions of Section J-2.
- g) Applications:
  - i) All applications for service connections two (2) inches or

smaller in diameter must be made to the City by the property owner of the premises to be supplied in accordance with the provisions of Section B. The applicant agrees to abide by the Rules and Regulations of the City.

- ii) Application for service connections larger than two (2) inches in diameter must be made to the City by the property owner of the premises to be supplied in accordance with the provisions of Section B. Such application shall include a sketch showing the desired size and location of the proposed service pipe. The applicant shall furnish his estimated requirements for fire flow, pressure, rate of consumption and such other pertinent data that will assist the City in its review of the application.
  - iii) Upon receipt of a completed application, the City will review its contents and render a decision within thirty (30) days excluding weekends and holidays.
  - iv) In the event the City finds the application to be incomplete, the City will notify the applicant of the reason(s) and what additional data must be submitted. Upon receipt of the necessary data, the City will proceed in accordance with Section J-3-g-iii of these Rules and Regulations.
- h) Permits:
- i) No excavation for the purpose of connecting to a water main is permitted without the approval of the application (Section J-3-g of these Rules and Regulations) and the issuance of a written permit by the City.
  - ii) No permit for a service connection will be issued until an agreement is signed by the applicant promising to pay for



- the disconnection of any customer-owned service connections formerly supplying the property.
- iii) No permit for a service connection will be issued if the applicant is a present customer who is in arrears on a water and/or sanitary sewer bill for another premises in the City.
  - iv) A permit shall expire one (1) year from the date it was issued. Permits may be extended by the applicant upon written request prior to the expiration date. The extension shall not exceed one (1) year.
  - v) Prior to the expiration date, a refund of the connection charge submitted may be made upon written request by the applicant.
  - vi) A new application and permit along with payment of the connection charge at the current rate is necessary in order to re-apply for a permit at a location where a previous permit has expired. This re-application must be consistent and in compliance with the then current Rules and Regulations of the City and the Code of Ordinances.
  - vii) A permit may be revoked at any time if it is found that the information provided on the application was incorrect.
  - viii) Connection charges shall be as designated in the City of Danbury Code of Ordinances.
  - ix) Permits shall be maintained at the site of the work being done and shall be shown upon request to any properly identified employee of the City.
  - i) Size - The City will determine the size of the service connection on the basis of the information provided by the applicant.

j) Service connection for vacant lot - A service connection will not be made where there is no structure on the property unless approved by the City. where approval is granted, a meter pit must be provided at or near the property line at the customer's expense. Meter pits to be installed in accordance with section F-3g.

4) Customer's Service Line;

- a) The customer shall furnish, install, own, and maintain at his expense the necessary curb box and service line from the curb stop to the place of consumption in accordance with the requirements of the City. The customer shall keep the curb box clean and free of debris so that it provides ready access to the curb stop. Where no curb stop exists, the customer's service line shall be the entire service pipe.
- b) A curb box meeting the specifications of the City shall be installed at each curb stop.
- c) No service line shall serve more than one (1) building without the approval of the City.
- d) Where approval has been granted for two (2) or more service lines to supply the same premises, and the service lines are interconnected, the customer must furnish, install and maintain an approved backflow prevention device on each line.
- e) A gate valve or ball valve shall be provided immediately inside the building. The City reserves the right to specify location of this valve.
- f) The above referenced valve (J-4-e) and adjacent piping shall be maintained by the customer in good condition to permit

operation of the valve in an emergency and to enable the City to change meter sets. If the customer fails to maintain the valve and adjacent piping in good condition, the City may make the necessary repairs or alterations at the customer's expense.

g) Where copper is used as the material for the customer's service line, one continuous run shall be made from the curb stop to the meter set.

5) Standards for Service Pipe:

a) Depth - Service pipe shall be installed with a minimum cover of four and one half feet.

b) Location:

i) Service pipe should run at right angles to the main in a straight line to the premises to be served. The approval of the City must be secured as to the proper location of the service pipe.

ii) The City shall determine the minimum requirement for the customer service line size which shall be in no case less than three quarters (3/4) of an inch in diameter. The City reserves the right to specify such diameter.

iii) In the event that the City water main is not in front of the premises to be served, an extension of the City's water system will be required. Reference is made to Section W of these regulations.

c) Materials:

i) Service pipe shall be copper, cement lined ductile iron. Or other City approved material.

ii) Copper shall be cold drawn or soft annealed seamless copper type "K" which meets American Water Works Association (A.W.W.A.)

standard specifications for this use. No soldered joints will be allowed underground.

- iii) Cement lined ductile iron must meet A.W.W.A. specifications and be of a class suitable for the pressures and load encountered.
- iv) No other material will be used without specific written approval of the City.

d) Trenching:

- i) Service pipe shall not be laid in the same trench with other underground facilities. In order to avoid possible damage, the customer performing the excavation for a new or renewed customer service line shall arrange with the other agencies which have subsurface rights for adequate notification and inspection.
- ii) Water service pipe and house sewer lines shall be laid in separate trenches at least ten (10) feet apart unless approved by the City.
- iii) The trench shall be backfilled with acceptable material which must be thoroughly tamped to secure a firm support.

- 6) Inspection - The service connection and service pipe must be left uncovered for inspection by an authorized City representative. Final approval of the service pipe up to the meter set may be subject to a satisfactory hydrostatic test, which may be required by the City following installation of the service connection.

K. FROZEN SERVICE:- Thawing a frozen service pipe is the responsibility of the customer.

L. LEAKS AND REPAIRS - If a leak develops in a service pipe, the customer shall repair it without delay. If such repair work is not completed within a reasonable period of time specified by the City in writing to the customer, the City may discontinue service to the premises until the leak is repaired by the customer or the City repairs the leak. In either case, service will not be restored until the customer pays the entire cost incurred by the City in making repairs and/or termination of service.

M. CUSTOMER'S PLUMBING:

- 1) The plumbing in all premises served by the City shall conform to all applicable State and municipal regulations.
- 2) Where a standby tank or cistern is used by the customer it shall:
  - a) Be constructed to protect the City water system from pollution.
  - b) Conform to the provisions of Sections 19-13-B37 and B38 of the Public Health Code of the State of Connecticut, and to all other applicable regulations. {Refer to Appendix A.}
  - c) Be provided with a means of access for inspection by the City.
  - d) Be provided with an adequate drain.
  - e) Be equipped with a City approved backflow prevention device on the service pipe.
- 3) Hot water boilers shall be provided with vacuum and relief valves; and, where additives are used in the system they shall be equipped with a reduced pressure device.
- 4) In opening the valve to let water through a customer service line, the valve shall be opened gradually and some convenient faucet left open to allow air to escape.
- 5) Any device required for the regulation of pressure at the customer's

premises shall be furnished, installed, owned and maintained by the customer at his expense.

- 6) If the customer has water using devices on his premises which in the opinion of the City are a potential hazard to the water distribution system, a backflow prevention device shall be installed and maintained by the customer in accordance with State regulations.

N. SANITARY REGULATIONS - The Public Health Code of the State of Connecticut and all other applicable State and municipal regulations, certain of which are found in Appendix A including Section 19-13-B8, 19-13-B39, and 19-13-B45 of the Public Health Code shall be adhered to.

O. WATER SPRINKLER SYSTEM:

- 1) Domestic Sprinkler System:
  - a) A domestic sprinkler system is a sprinkler system which serves a premises used only for residential purposes.
  - b) A domestic sprinkler system shall be connected to the domestic service to the premises and is to be connected beyond the domestic meter.
  - c) An application for domestic sprinkler system service shall be made by the property owner consistent with Section B of these regulations.
- 2) Commercial/Industrial Sprinkler System:
  - a) A commercial/industrial sprinkler system is one which will serve a premises a part or all of which is used for commercial and/or industrial purposes.
  - b) A commercial/industrial sprinkler system is to be supplied separately from the domestic service to the premises in either of

the following manners:

- i) Separate taps on the main for adequately sized domestic and fire/sprinkler service lines are made and the domestic and fire/sprinkler service pipes are then run independently to the premises. Each service pipe shall have a shut-off valve and curb box. The domestic service pipe shall have a meter which meets the requirements outlined by these regulations. The fire/sprinkler service pipe shall be equipped with a fire detection check and meter acceptable to the City.
- ii) One tap on the main for a combined domestic and fire/sprinkler service pipe can be made. The combined domestic and fire/sprinkler service pipe shall be sized to handle all the domestic and fire flow needs of the premises being served and shall be equipped with a shut-off valve and curb box. At a point ten (10') feet outside of the building wall the domestic and fire/sprinkler services are to split. The domestic service shall be tapped into the combined domestic and fire/sprinkler service pipe and run separately into the building with the appropriate meter as outlined in these regulations. A shut-off valve shall be installed on this domestic service pipe near the tap into the combined domestic and fire/sprinkler service pipe. A shut-off valve and a fire detection check and meter are to be installed on the fire/sprinkler service pipe.

**P. FIRE SERVICE - PRIVATE:**

- 1) Installation - Private fire lines shall be installed in accordance with the rules and regulations covering service pipes.
- 2) Private fire lines, hydrants and appurtenances shall be maintained

by the owner at his expense.

- 3) Meters:
  - a) All sprinkler systems and private fire service lines shall be metered, or an alarm system may be installed if approved by the City. These meters must be approved by the City.
  - b) Fire detection checks and meters shall be tested and maintained by the City at the customer's expense at intervals determined by the City.
- 4) Access - City representatives shall have access to fire detection checks and alarm systems.
- 5) Use - No person shall take water from any private fire hydrant, hose plug, sprinkler system, or fire line for any purpose other than fire fighting. Test of such private system may be performed only with the prior approval of the City.
- 6) Antifreeze solutions - For sprinkler systems supplied water by the City, the use of antifreeze solutions other than water solutions of pure glycerine (C.P. or U.S.P. 96.5% grade) or propylene glycol (U.S.P. grade) is prohibited. The use of antifreeze solutions must conform to any applicable State or local health regulations. A reduced pressure device is required.
- 7) Charges - Private fire service lines and combination service lines.
  - a) A quarterly charge for private fire service lines based on the size of the service pipe at the main is established in the City of Danbury Code of Ordinances.
  - b) A quarterly charge will be made for each combination service line based on the size of the fire service pipe at the point immediately beyond the split between the domestic and fire



service and is established in the Code of Ordinances.

Q. FIRE SERVICE - PUBLIC: Public hydrants are to be maintained by the City of Danbury. No person shall take water from any public hydrant without prior approval of the City.

R. INTERFERENCE WITH OPERATIONS:

A customer interfering with or endangering the proper operation of the City's system or its service to others is liable for any damage; and, if directed by the City shall, without delay, make any alterations to the plumbing system or water appliances as the City shall require for the safe and proper operation of its service.

S. SPECIAL REQUIREMENTS:

A customer whose water needs cannot be met adequately or safely by the regular facilities of the City may be required by the City to install additional facilities at the customer's expense. This regulation is intended to apply, but not to be limited to the delivery of adequate pressure to multi-story buildings, and/or to equipment requiring high volumes of supply for intermittent periods.

T. LIMITED SERVICE:

A limited service agreement will be required of an applicant when in the opinion of the City the premises to be served is at such an elevation that normal satisfactory minimum average water pressure may not be available. Under a limited service agreement, the applicant agrees to accept the water service furnished under such pressures as may be available.

U. CITY RESPONSIBILITIES:

- 1) The City undertakes to supply its customers with water which meets the requirements of the State Department of Health Services, and which has such physical and chemical properties to make it acceptable for domestic use. However, the City does not undertake to render any special service, to maintain any fixed pressure, or to deliver any fixed quantity of water.
- 2) The City shall not be liable for any damage to personal property sustained as a result of a break, failure or accident in or to its system or any part thereof, which is not due to the City's negligence, or which, being known to the customer was not reported by the customer in time to avoid such damage.
- 3) From time to time the City may temporarily discontinue water service to flush its mains or to make necessary repairs or alterations. In such an event the City will make every reasonable effort to notify its customers in advance of such interruption.

V. CONSERVATION OF WATER:

- 1) The City may restrict the use of the water by any customer or class of customers when in its judgment such restriction is in the best interest of the public.
- 2) A customer shall repair or alter his service line, plumbing system or water using equipment when in the City's opinion, the customer's installation operates wastefully.
- 3) Air Conditioners: No customer shall use or install any air conditioning system unless such system is desired to recirculate water.
- 4) Car Washes: No customer shall use or install any car washing system unless such system is designed to recirculate water.

**W. WATER MAIN EXTENSIONS:**

- 1) Where water service is desired for a premises, an adequate water main must exist in a location which will allow a right angle service pipe to be run between the main and the premises. Where such a service pipe connection cannot be made, an extension of the City water main will be required. Whenever it is determined by the City Engineer and the Superintendent of Public Utilities that a right angle service pipe is impractical because of site layout, topography, geography, soil or other field or engineering conditions, the City Engineer and the Superintendent of Public Utilities will determine the manner in which the service pipe is to be installed and the point to which a water main is to be extended if an extension is required.
- 2) Common Council approval is required for all water main extensions. Petition forms for extensions can be obtained at the office of the City Clerk.
- 3) The petitioner shall bear all costs relative to the installation of the water main.
- 4) If the petition is approved by the Common Council, the petitioner shall have detailed engineering plans and specifications, prepared by a State of Connecticut licensed engineer and submitted to the City Engineer and the Superintendent of Public Utilities for review and approval prior to the start of construction.
- 5) All water main extension installations are to be inspected by the Public Works Department. Prior to acceptance by the City, all mains must be disinfected, flushed and pressure tested in manners acceptable to the Public Works Department.

- 6) Once construction of the water main extension is completed, the petitioner shall submit as-built drawings of this extension. These drawings are to be prepared by a licensed Connecticut Land Surveyor and are to be satisfactory to the City Engineer.
- 7) Upon completion of the extension, title to the water main extension and/or water facilities as well as to any easement through property upon which is located all or such portions of the water main and/or water facilities as the City Engineer's office determines are of potential benefit to other landowners in the City shall be conveyed to the City. In addition, the City Engineer may require the conveyance of easements through other property upon which no water mains or related water facilities are located but which may be of benefit to the City of Danbury for purposes of future water main extensions or water system improvements. Should another, other than the petitioner, hold title to any land involved in the system improvements, then all necessary easements shall be obtained from any such property owner prior to the commencement of any construction. All legal documents submitted are to be in forms satisfactory to the Corporation Counsel and City Engineer
- 8) No Certificate of Occupancy shall be issued until the above noted forms, documents, plans, etc. are received and the City owns the extended water mains and other system improvements.
- 9) A time limit for the completion of the water main extension shall be set by the Common Council.
- 10) All water main extensions are to be constructed in accordance with City standards and specifications for size, materials, methods of construction and other criteria.

X. STANDARDS & SPECIFICATIONS FOR DESIGN AND CONSTRUCTION: The Public Works Department is hereby authorized to promulgate minimum standards and specifications for design and construction of its water works.



ADDENDUM TO

## **RULES AND REGULATIONS**

**CITY OF DANBURY WATER DEPARTMENT**

**May 1, 1988**

ADDENDUM TO RULES & REGULATIONS  
CITY OF DANBURY WATER DEPARTMENT

Paragraph F, 3 b (Page 6) is changed to read as follows:

- b) Water meters greater than one (1) inch in size installed after September 29, 1987 shall become the property of the City and will be furnished and installed by the customer at no cost to the City.

Paragraph F, 3 c (Page 6) is changed to read as follows:

- c) Water meters greater than one (1) inch in size installed prior to September 29, 1987 shall remain the property of the customer until such time as the customer complies with Section F-8.

Paragraph F5 (Page 7) is changed to read as follows:

- 5) Maintenance of Meters- All meters one (1) inch and smaller in size shall be maintained by the City at no cost to the customer. Meters larger than one (1) inch in size which are owned by the City shall be maintained by the City at the customer's expense. Meters larger than one (1) inch in size which are owned by the customer shall be maintained by the City at the customer's expense. Damage to all meters due to freezing, hot water, or external causes shall be paid for by the customer and the customer shall be liable to the City for all damage to said meter which results from the customer's negligence.

Paragraph J2 (Page 12) the following is added to the end of this paragraph.

A demolition release shall not be issued until all water and sewer charges are paid in full.

Paragraph J4 (Page 17) the following paragraph is added.

- h) The customer shall install and maintain a check valve on the ingoing service line.

Appendix A (Pages A-1 thru A-5) is added.

Appendix A  
Rules and Regulations



**19-13-B37. Cross connections between water supplies prohibited**

No physical connection between the distribution system of a public water system and that of any other water supply shall be permitted, unless such other water supply is of safe sanitary quality and the interconnection of both supplies is approved by the State Department of Public Health. No officer, board, corporation or other person or group of persons, owning, managing or controlling any public water system, shall provide new water service to a site where any person, firm or corporation either maintains such connection or is not in compliance with Section 19-13-B38a of the Regulations of Connecticut State Agencies at this location. Upon written order by the local health department or the Department of Public Health, an officer, board, corporation or other person or group of persons, owning, managing or controlling any public water system, shall terminate existing water service to a site where any person, firm or corporation either maintains such connection or is not in compliance with Section 19-13-B38a of the Regulations of Connecticut State Agencies at this location. (Effective June 25, 1985; Amended July 7, 1993; Amended effective December 5, 2001.)

**19-13-B38a. Permissible arrangements for connections to public water supply lines**

(a) Definitions. As used in this section:

- (1) "Air gap" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or outlet supplying water to a tank plumbing fixture, or other device, and the flood level rim of the receptacle. The vertical physical separation shall be at least two times the inside diameter of the water inlet pipe above the flood rim level but shall not be less than one inch;
- (2) "Air vent type backflow preventer" means a device containing two independently operating check valves separated by a chamber which can automatically vent to the atmosphere if backflow occurs;
- (3) "Atmospheric vacuum breaker" means a mechanical device which automatically air vents a pipeline to prevent backsiphonage;
- (4) "Double check valve assembly" (DCVA) means a device which contains two independently acting check valves located between two tightly closing shut-off valves and fitted with properly located test cocks;
- (5) "Fire sprinkler system" for fire protection purposes means an integrated system of underground and overhead piping designed to provide fire protection for a building or structure. The installation includes one or more automatic water supplies. The portion of the sprinkler system above-ground is a network of specially sized or hydraulically designed piping installed in a building, structure, or area generally overhead, and to which sprinklers are attached in a systematic pattern. The valve controlling each system riser is located in the sprinkler riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area;
- (6) "Hose bibb vacuum breaker" means an atmospheric vacuum breaker designed to be attached to an outlet having a hose connection thread;
- (7) "Owner" means the customer of a public water system;
- (8) "Pressure vacuum breaker" means a device which contains a spring loaded check valve and a spring loaded atmospheric vent which opens when the pressure

approaches atmospheric. The unit shall include two tightly closing shut-off valves located at each end of the device and two test cocks properly located for testing the device;

(9) "Reduced pressure principle backflow preventer" (RPD) means a device containing within its structure a minimum of two independently acting, approved check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve reduces the system pressure a predetermined amount so that during normal flow and a cessation of normal flow the pressure between the checks shall be less than the system pressure. In case of leakage of either check valve, the differential relief valve, by discharging to atmosphere, shall operate to maintain the pressure between the checks less than the system pressure. The unit shall include tightly closing shut-off valves located at each end of the device and each device shall be fitted with properly located test cocks;

(10) "Siamese connection" means an inlet equipped with one or more couplings to which a fire hose can be attached and through which water can be delivered by a fire department pumper to a sprinkler system; and

(11) "Toxic or objectionable substance" means any compound which could affect the public health, the potability, or the aesthetic quality of the water.

(b) Air Gap. An air gap is required between all potable water lines and equipment or systems which may be subject to contamination.

(c) Reduced pressure principle backflow preventer.

(1) A reduced pressure principle backflow preventer (RPD) is required on a line to all facilities where toxic or objectionable substances are used in addition to the required air gap, vacuum breaker or RPD on individual pieces of equipment unless the public water system has determined that an RPD is not necessary. Where such substances are used in a specific area, an RPD on the line to that area may be used in place of the RPD on the line to the facility.

(2) The owner shall install a reduced pressure principle backflow preventer (RPD) or an air gap in the following instances:

(A) On a line to fire sprinkler systems (including tanks) where chemicals are added or to foam fire fighting systems;

(B) On a line to pressurized water systems on ships;

(C) On a line used to supply car wash facilities where pressure is boosted;

(D) On a line to irrigation or lawn sprinkler systems where chemicals are added;

(E) On a line to all boiler systems where chemicals are added;

(F) On a line to heat exchangers where chemicals are added;

(G) On a line to solar heating systems where chemicals are added;

(H) On a line to plating tanks or areas. No potable water use will be allowed downstream of the device pursuant to section 19-13-B38a(e)(2) of the Regulations of Connecticut State Agencies.

(3) Unless otherwise required by sections 19-13-B38a(b) or 19-13-B38a(c) of the Regulations of Connecticut State Agencies, the owner shall install either an RPD or an air vent type backflow preventer or an air gap in the following instances:

- (A) Water supply lines to all boiler systems where chemicals are not added;
- (B) Water supply lines to carbonators for beverage machines, water conditioning systems, and commercial ice making equipment;
- (C) Water supply lines connected to solar heating systems where chemicals are not added and heat exchangers where chemicals are not added;
- (D) Water supply lines to storage tanks used for fire protection where chemicals are not added.

(d) Double Check Valve Assembly. The owner shall install a double check valve assembly (DCVA) on public water supply lines to fire sprinkler systems with siamese connections unless chemicals are added to the fire sprinkler system. Where chemicals are added to such systems, the owner shall install an RPD pursuant to Section 19-13-B38a(c)(2)(A) of the Regulations of Connecticut State Agencies. An owner may install an RPD instead of a DCVA on public water supply lines to fire sprinkler systems with siamese connections.

(e) Vacuum breaker. The owner shall install either an atmospheric vacuum breaker or a pressure vacuum breaker or an air gap in the following instances:

- (1) Irrigation or lawn sprinkler systems where chemicals are not added;
- (2) Flush valve toilets;
- (3) Inlets which are or may become submerged, except where an RPD is required pursuant to section 19-13-B38a(c)(2) of the Regulations of Connecticut State Agencies;
- (4) Hemodialysis units;
- (5) At marinas and docks on all hose bibbs or other outlets to which a hose may be connected.

(f) Installation and maintenance. The devices required by section 19-13- B38a of the Regulations of Connecticut State Agencies shall be purchased, owned, installed, and maintained by the owner in compliance with the following conditions:

- (1) New devices shall conform to the revision of American Water Works Association Standard C510, C511 or the revision of the applicable standard of the American Society of Sanitary Engineering in effect at the time of building permit application.
- (2) There shall be no connection made for potable water use downstream of an RPD and upstream of the equipment or systems subject to contamination except where the device is installed on the service line and the required air gap, vacuum breaker, or RPD is provided on all individual pieces of equipment.
- (3) Each RPD, DCVA and pressure vacuum breaker shall be located in a room or structure that is well lighted, properly drained, and not subject to flooding. These devices shall be easily accessible for repair, testing and inspection.
- (4) There shall not be any bypass around a device without appropriate protection as required by Section 19-13-B38a of the Regulations of Connecticut State Agencies.

(5) If an RPD or DCVA cannot be removed from service for maintenance and testing during normal working hours, then a second device of the same type shall be installed in parallel so as to permit inspection and repair of either unit.

(6) The owner shall notify the public water system prior to the installation of any RPD, DCVA or pressure vacuum breaker required by Section 19-13-B38a of the Regulations of Connecticut State Agencies. Immediately after installation of such devices, the owner shall arrange for the public water system to have each device tested by a person who has met the requirements of Section 25-32-11(e) of the Regulations of Connecticut State Agencies.

(7) The public water system shall have each RPD, DCVA and pressure vacuum breaker tested annually and shall maintain records of the test. Any malfunctioning device shall be promptly restored to proper operating condition by the owner. A summary of the results shall be forwarded to the Department of Public Health as a part of the annual cross connection survey report. All tests must be performed by a person who has met the requirements of Section 25-32-11(e) of the Regulations of Connecticut State Agencies.

(8) Atmospheric vacuum breakers shall be located beyond the last control valve prior to the first outlet. All vacuum breakers shall be installed at an elevation higher than any outlet according to manufacturers instructions.

(9) An atmospheric vacuum breaker shall be installed so that it is not subject to backpressure or continuous operating pressure of more than twelve (12) hours duration. Where vacuum breakers are to be installed under section 19-13- B38a(d) of the Regulations of Connecticut State Agencies and a continuous operating pressure exists, a pressure vacuum breaker shall be used.

(10) An atmospheric vacuum breaker shall be installed in such a fashion that it will not be subject to corrosion which will render it inoperative.

(11) The owner is responsible for complying with all building, plumbing, fire safety or other applicable codes, regulations or requirements.

(g) Civil Penalties.

(1) Notice of violation. When the Commissioner determines that a violation of Section 19-13-B38a(d) of the Regulations of Connecticut State Agencies has occurred or is occurring, the commissioner may so notify the violator and may impose a civil penalty in accordance with this subsection if compliance is not achieved by the date specified in the notice of violation.

(2) Appeals. Within twenty days (20) after such notice is sent by the commissioner, an owner in receipt of a notice of violation issued pursuant to this subsection may petition the commissioner in writing, by U.S. mail, certified or registered, postage prepaid, return receipt requested, for an opportunity to contest the determination that a violation occurred, the determination a violation has not been corrected, the initial date of the imposition of the penalty, and the imposition of a penalty.

(3) Penalty. Failure to install a device required pursuant to Section 19-13-B38a(d) of the Regulations of Connecticut State Agencies shall result in a penalty of not more than \$2000.

(Effective March 7, 1989; Amended July 7, 1993; Amended effective December 5, 2001.)

**19-13-B39. Quality of water supplies made available for public and for employees.** No water supply shall be used or rendered available for drinking and for other personal or domestic purposes in any industrial plan, mercantile establishment, hotel, lodging or boarding house, tenement house, hospital, theatre, park or public building, or on any outdoor or construction work, unless such supply is of safe sanitary quality approved by the state department of health. If a water supply for industrial or fire protection purposes is obtained entirely or in part from a source not approved for drinking purposes, this supply shall be distributed through an independent piping system having no connection with the systems for drinking and for other domestic use.

**19-13-B45. Minimum requirements for drainage and toilet systems.**

(a) Plumbing and drainage systems shall be so constructed as to avoid contamination of safe drinking water supplies in houses or buildings. There shall be no cross connections between such safe water supplies and unsafe water supplies nor shall such safe supplies be piped to refrigeration, air conditioning or other mechanical equipment provided with direct connections to drains or constructed in such a manner as to permit contaminated water to be siphoned or drawn into the water supply pipes. Storage of drinking water in buildings shall be only in covered tanks so constructed as to avoid any possible contamination of the water in the tanks. Sewer or waste lines located above storage tanks and direct overflows and drains to sewer systems are expressly prohibited.

(b) Buildings in which water closets and other plumbing fixtures exist shall be provided with a supply of water adequate in volume and pressure for flushing purposes.

(c) The pipe system shall be of sufficient size to supply water for adequate flushing of toilet fixtures without unduly reducing the pressure at other fixtures.

(d) Devices for heating water and storing it in "boilers" or hot water tanks shall be so designed and installed as to prevent all dangers from explosion.

(e) Each tenement, lodging or boarding house located on premises abutting any street or alley where running water is available and through which there is a sewer with which connection may be had shall be provided with water closets connected with such sewer. All other buildings used or intended to be used for human habitation or occupancy on premises abutting a street in which there is a public sewer shall be connected with such sewer whenever required by the local authorities having jurisdiction.

(f) Tenement houses erected prior to September 1, 1930, and provided with house drainage systems shall be furnished with at least one water closet for each two apartments of three rooms or less each, and one such closet for each apartment of four or more rooms. Tenement houses erected after August 31, 1930, and prior to July 1, 1941, shall have a water closet in each apartment of three or more rooms and at least one water closet for each two

apartments of less than three rooms each. In each tenement house erected or subdivided after June 30, 1941, there shall be a water closet in each apartment of two or more rooms.

(g) Plumbing fixtures shall be made of smooth non absorbent material, shall be free from concealed fouling surfaces and shall be set free of enclosures.

(h) The entire house drainage system shall be so designed, constructed and maintained as to conduct the waste water or sewage quickly from the fixture to the place of disposal with velocities which will guard against fouling and the deposit of solids and will prevent clogging.

(i) The drainage pipes shall be so designed and constructed as to be proof for a reasonable life of the building against leakage of water or drain air due to defective materials, imperfect connections, corrosion, settlements or vibrations of the ground or building, temperature changes, freezing or other causes.

(j) The drainage system shall be provided with an adequate number of cleanouts so arranged that in case of stoppage the pipes may be readily accessible.

(k) Each fixture or combination fixture shall be provided with a separate, accessible, self-scouring, reliable water-seal trap placed as near to the fixture as possible.

(l) The house-drainage system shall be so designed that there will be an adequate circulation of air in all pipes and no danger of siphonage, aspiration or forcing of trap seals under conditions of ordinary use.

(m) The soil stack shall extend full size upward through the roof and have a free opening, the roof terminal being so located that there will be no danger of air passing from it to any window and no danger of clogging of the pipe by frost or by articles being thrown into it or of roof water draining into it.

(n) The plumbing system shall be subjected to a water or air-pressure test and to a final air-pressure, smoke or peppermint test in such a manner as to disclose all leaks and imperfections in the work.

(o) No substances which will clog the pipes, produce explosive mixtures or destroy the pipes or their joints shall be allowed to enter the house drainage system.

(p) Refrigerators, ice boxes or receptacles for storing food shall not be connected directly with the drainage system.

(q) No water closet shall be located in a room or compartment which is not properly lighted and ventilated to the outer air.

(r) If water closets or other plumbing fixtures exist in buildings where there is no public sewer accessible, suitable provision shall be made for disposing of the sewage without nuisance. The location and construction of private sewage disposal systems shall conform to the requirements of sections 19-13-B20a to 19-13-B20r, inclusive.

(s) Where a house-drainage system may be subjected to back flow of sewage, suitable provision shall be made to prevent its overflow in the building.

(t) No plumbing fixture nor waste outlet shall be installed which will provide a cross connection between a distributing system of water for drinking and domestic purposes and a drainage system, soil or waste pipe and permit or make possible the back flow or siphonage of sewage or waste into the water supply.

Note: Attention is directed to the danger from under-rim water inlet fixtures and flushometer valves without adequate vacuum breakers.

(u) All drinking fountain installations or replacements after January 12, 1954, shall be constructed with a slanting jet issuing from a nozzle of non-oxidizing impervious material with a non-oxidizing guard to prevent the mouths and noses of persons using the fountain from coming in contact with the nozzle. The jet shall be located so as not to touch the guard and shall be discharged at such an angle that the water can neither fall back nor be forced back on to the point of discharge. The fountain jet and all openings in the water supply piping shall issue above the level of the fountain bowl. The drainage from the bowl shall be adequate and so constructed as to prevent fouling of the bowl. The drain from the fountain shall not have a direct physical connection to a waste pipe unless the drain is trapped. The waste opening and pipe from the fountain shall be of sufficient size to carry off the water promptly. The opening shall be provided with a strainer. All drinking fountains installed after January 12, 1954, shall be provided with their own receiving bowls and shall not be installed over sinks used for hand washing or other purposes.

(v) Plumbing systems shall be maintained in a sanitary condition.  
(Effective December 21, 1978.)

## **APPENDIX F**

### **INDEX ROAD, DRIVEWAY, AND SIDEWALK SPECIFICATIONS AND DETAILS**

#### **SPECIFICATIONS**

- Road
- Driveways
- Sidewalk and Driveway Specifications
- ADA Replaceable (Wet-Set) Composite Unit
- Concrete Mix Design Submittal
- Consolideck Saltguard WB

#### **DETAILS**

- Typical Roadway Section
- Temporary Pavement Repair Details
- Permanent Pavement Repair Details
- Concrete Sidewalk
- Concrete Curb
- Integral Concrete Curb/Sidewalk
- Concrete Apron Detail with Integral Curb
- Granite or Stone Curbing
- Driveway Detail with Sidewalk
- Driveway Detail without Sidewalk
- Apron and Driveway Detail with and without Sidewalks
- Bituminous Asphalt Lip Curb
- Guiderail Location Detail



January, 2010  
Rev. August 18, 2010  
Rev. October, 25, 2011  
Rev. June 5, 2012  
Rev. October 1, 2012

## **ROADS**

Road construction is to conform to the requirements of the City of Danbury Subdivision Regulations and to Engineering Division of the City of Danbury Public Works Department plan review comments.

Petitions or requests for acceptance of roads must be submitted to the City Council of the City of Danbury between April 1 and October 31 inclusive. Such petitions shall contain the recommendation of the Planning Commission of the City of Danbury in accordance with Section 8-24 of the General Statutes of the State of Connecticut, as amended.

## **DRIVEWAYS**

A driveway shall consist of a 1½" lip at the roadway edge of pavement, a driveway apron section (with or without a sidewalk area), a transition section and the remaining portion of driveway.

The section of driveway between the roadway edge of pavement/1½" lip and the roadway right of way line (the apron and sidewalk sections) is to be graded to drain towards the roadway.

The driveway apron (between the 1½" lip at the roadway edge of pavement and the roadway right of way line) is to have a minimum slope of one quarter inch per foot (¼" per foot)/two percent (2%) and a maximum slope of three percent (3%). If a sidewalk is installed across the driveway apron, the area between the sidewalk and the 1½" lip is to have a minimum slope of ¼" per foot/two percent (2%) and a maximum slope of three percent (3%). The sidewalk is to be 5 feet wide and is to have a cross slope of 2%.

The transition section (the first 30 feet measured from the roadway right of way line) shall have a maximum eight percent (8%) slope. This eight percent (8%) slope standard does not apply to a rear lot served by an accessway.

The remaining driveway beyond the transition section shall have a maximum slope of twelve percent (12%).

Single driveways shall be twelve (12) feet wide and paved for a minimum distance of twenty (20) feet from the edge of the road travel way.

Joint driveways shall be sixteen (16) feet wide and paved for a distance of twenty (20) feet measured from the edge of the road travel way (edge of pavement).

All proposed driveways shall possess an unobstructed sight distance in accordance with the table found in the Subdivision Regulations.

## **SIDEWALK AND DRAINAGE SPECIFICATIONS**

### **A. DESCRIPTION OF WORK**

1. Saw cut existing street pavement, sidewalks and driveways where material is to be removed.
2. Demolish, remove and properly dispose of existing concrete, stone and bituminous concrete sidewalks; concrete, stone and granite curbs; bituminous concrete pavement and any other debris or unacceptable materials encountered during demolition. All granite stone curbing determined to be salvageable by the City is to be saved and delivered to the City of Danbury Public Works complex on Newtown Road.
3. Prepare subgrade and provide, place and compact processed aggregate material base necessary for the new sidewalks, curbs, ramps for the handicapped, driveway aprons, driveway ramps and road pavement.
4. Provide and place forms for sidewalk, curbs and ramps using proper tools and equipment necessary to place concrete.
5. Provide and place 6"x 6" No. 10 U.S. standard gauge wire mesh reinforcement in sidewalks and ramps for the handicapped. In addition, curbs shall have No. 3 reinforcing steel rebar and driveway ramps shall have No. 3 reinforcing steel rebar, as shown on the details. All reinforcement shall be supported in an approved manner while placing concrete.
6. Use early strength concrete for sidewalks, curbs and ramps. No vehicles shall be allowed to travel on new sections of driveway ramps and driveway aprons for four days from the date concrete is placed. Adequately protect new concrete from damage (use barriers, etc.). Maintain wood plank pedestrian walkways for all residential and business entrances at all times. The Contractor is responsible for coordinating access and non-access to adjacent properties with the property owners.
7. Adjust to grade any existing water curb boxes, sanitary sewer manhole frames and other utility covers to the satisfaction of the Public Utilities Division of the City of Danbury Public Works Department or the appropriate other utility company.
8. Protect utility poles and conduits.
9. Provide, place and broom finish DOT modified Class "C" concrete conforming to ACI 301-99 and ACI 318-05 (4,500 psi) and Connecticut DOT specifications for sidewalks, driveway ramps and ramps for the handicapped. See attached "Concrete Mix Design Submittal."

This work shall also include but not be limited to expansion joints, scored joints, broom finish, rubbing, curing, and concrete protection, all as directed by the City of Danbury Public Works Department Engineering Division or Construction Services Division.

10. Provide ramps for the handicapped as shown on the detail. Provide 24"x36" Wet Set ADA Replaceable Tactile Warning Surface Unit (color red) as manufactured by ADA Solutions, Inc., P.O. Box 3, N. Billerica, MA 01862, or approved equal in each ramp for the handicapped. See ASA Solutions, Inc. Installation Procedure, ASA Replaceable (Wet-Set) Composite Detectable Warning Surface, and Detail found later in this guide.
11. Saw cut existing bituminous pavement two feet (2') beyond the damaged pavement in a clean and straight line, with a minimum 3" deep cut. Tack coat edges of saw cut with asphalt emulsion SS-1 and seal joint with hot applied bituminous sealer.
12. Pave roadway along edge of new and reset curbing and driveway aprons. A minimum of 3" thick compacted bituminous concrete Class 2 is to be placed in two layers.
13. Replace any existing signs in sidewalks which signs had been removed during construction. If sign posts were damaged during removal by the Contractor, new posts are to be provided.
14. The areas between the new concrete sidewalk and existing adjacent driveways and sidewalks are to be filled in using concrete or bituminous concrete, as directed by the Superintendent of Highways, City Engineer, Superintendent of Construction Services or Director of Public Works of the City of Danbury.
15. Caulk all expansion joints with approved self-level caulk. Color and specification to be approved by the Superintendent of Highways, City Engineer, Superintendent of Construction Services or Director of Public Works of the City of Danbury.
16. Provide for maintenance and protection of traffic – traffic control devices, traffic control officers, coordination with the City of Danbury Police Department and any necessary signs, during construction.
17. Contractor will be responsible for meeting finished grades and elevations, as shown on the approved plans.
18. Contractor shall provide and pay for all concrete testing. Testing shall be performed by a laboratory (NVLAP) certified by the State of Connecticut.

19. Contractor is to bring in proper fill, topsoil (6 inches in thickness), seed and mulch for all disturbed grass areas. Contractor will be responsible for provision of adequate grass cover in disturbed areas and shall be responsible for the first grass cutting.
20. A salt guard protective compound acceptable to the City (Consolideck Saltguard WB – see specification found later in this guide, or approved equal) is to be applied to all concrete sidewalks, ramps for the handicapped, driveway aprons and curbs. Prior to saltguard application, the concrete is to be cleaned, as per the manufacturer's recommendation.
21. Contractor is to clean the work area to a broom clean condition at the end of each day.
22. The Contractor shall comply with these specifications and the applicable sections of the State of Connecticut Department of Transportation Standard (and current Supplemental) Specifications for Roads, Bridges and Incidental Construction, Form 816, latest revision.
23. Prior to the start of construction, the Contractor will be responsible for contacting "Call Before You Dig" at 1-800-922-4455.

## **B. PERMITS**

Before work can begin on a project, the Contractor shall obtain a road opening permit and an erosion and sedimentation control permit from the City . Applications for these permits are to be submitted to the City of Danbury Permit Center located on the first floor of City Hall.

## **C. GENERAL: WALKS, CURBING, DRAINAGE and ROADWAY**

1. Excavation:
  - a. The Contractor shall remove existing sidewalks, ramps for the handicapped, driveway aprons and driveway ramps and excavate where directed in all areas which are to receive new sidewalks, new ramps for the handicapped, new driveway aprons or new driveway ramps, to a depth as shown on the contract plans and details.
  - b. Bituminous roadway pavement is to be saw cut where pavement is to be removed.
  - c. Where a new sidewalk abuts an existing sidewalk or driveway, the Contractor shall carefully saw cut the existing concrete or bituminous

concrete in a neat manner to insure a neat, straight, and square transition from new to existing sidewalk.

2. Processed Aggregate Base: The base shall be wetted and rolled or tamped before laying sidewalks, ramps for the handicapped, driveway aprons and driveway ramps. The City of Danbury Superintendent of Construction Services or an appointed designee shall inspect the compacted gravel base before any concrete is placed.
3. Reinforcement: All concrete sidewalks and ramps for the handicapped shall be reinforced with 6 inch by 6 inch No. 10 U.S. standard gauge wire mesh. In addition, curbs shall have No. 3 reinforcing steel rebar and driveway ramps shall have rebar reinforcement, as shown on the details. Reinforcement shall conform to the requirements of Article M.06.01 of the State of Connecticut Department of Transportation Standard (and current Supplemental) Specifications for Roads, Bridges and Incidental Construction, Form 816, latest revision. Wire mesh shall conform to the requirements of ASTM A185 and shall be furnished in flat sheets not rolls. Where mesh is spliced, it shall overlap adjacent mesh by not less than one full square and be securely wired together. Reinforcement mesh shall be supported in an approved manner to be certain it is properly positioned while placing concrete.
4. Forms: Forms shall be of metal or wood, straight, free from warp, and of sufficient strength to resist springing from pressure of concrete. If of wood, they shall be 2 inch surfaced plank except that at sharp curves, thinner material may be used. If of metal, they shall be of approved section and shall have a flat surface on the top. Forms shall be of a depth equal to the depth of the sidewalk. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them.
5. Joints: The expansion joints shall be placed at 20 foot intervals, at end limits of construction, at the back of curbs, around utility pole bases, and at concrete steps and walks. Material shall be Closed Cell Poly-ethylene Foam. Samples must be submitted to the City of Danbury for approval. The pattern shall match adjacent sidewalks or be as approved by the City of Danbury Superintendent of Construction Services or an appointed designee. Expansion joints in the sidewalk shall be formed by using  $\frac{1}{2}$  inch non-extruding preformed joint filler, as approved. Dummy Joints shall be made every 5 feet between expansion joints. They shall be made with a scoring tool while the concrete is still workable to a depth of at least one (1) inch. No tool marks other than the joint itself shall be visible.

## 6. Concrete:

- a. The concrete shall be proportioned, mixed, placed, etc. in accordance with the provisions of Section 6.01 of the State of Connecticut Department of Transportation Standard (and current Supplemental) Specifications for Roads, Bridges, and Incidental Construction, Form 816, latest revision, for DOT modified Class "C" concrete (4,500 psi) conforming to ACI 301 and ACI 318 - 399. The City requires a copy of a weighted batch ticket for each load of concrete placed, which shall conform to the specified mix design Modified Class C 4,500 PSI.
- b. The concrete shall contain not less than 5 nor more than 7.5 percent entrained air at the time the concrete is deposited in the forms. Air-entraining Portland cement and air-entraining admixtures shall conform to Article M.03.01 of the above mentioned State of Connecticut Form 816.
- c. Air-entrainment shall be obtained and the concrete cured in accordance with the provisions of Article 4.01.3 for concrete pavement in the above noted State of Connecticut Form 816 for Concrete Pavement.
- d. The Contractor will be required to provide and pay for testing by a certified testing laboratory of all concrete. A minimum of five (5) test specimens shall be taken for every fifty (50) cubic yards of concrete or not less than four (4) test specimens for each day's placement. Two (2) cylinders shall be tested at seven (7) days and two (2) at twenty eight (28) days. The specimens shall be carefully stored and transported so as not to damage them in any way. Records shall be kept identifying each cylinder with the location of placement from which the test cylinder was taken. Slump tests shall be performed when each set of test cylinders is cast. The testing laboratory shall send copies of test reports to the City of Danbury Public Works Department Construction Services Division that is supervising the project. If any concrete fails to develop the required twenty eight (28) day strength, the City may order additional testing or order the removal and replacement of such concrete at the Contractor's expense.

## 7. Finishing:

- a. The surface of the concrete shall be finished with a stiff bristle street broom perpendicular to the curb face. The outside edges of the slab and all joints shall be edged with a ¼ inch radius tool.
- b. No pedestrian traffic on concrete walks shall be permitted for a period of three (3) days after placement of concrete.

**c. The Contractor shall take whatever steps are necessary to prohibit the defacement of any concrete. Any defaced concrete must be cut out and replaced at the Contractor's expense.**

8. Curing and Anti-Spalling Compound: When concrete is firm enough to be walked on, a curing and anti-spalling compound shall be applied. Spray two coats at a combined coverage of 175 to 250 square feet per gallon or roll one coat at the same rate of Consolideck Saltguard WB as provided by Prosoco Inc. The City of Danbury Public Works Department Engineering Division or Construction Services Division or an appointed designee is to witness the application of the curing compound. Compound shall be delivered to the site in sealed and labeled containers and in sufficient quantity to ensure specified coverage. The Contractor is reminded that prior to Saltguard application, the concrete is to be cleaned as per the manufacturer's recommendations (see cut sheet).
9. Thickness: Concrete shall be 5" thick for sidewalks, 6" thick for driveway ramps and 17" - 18" thick for curb, or as shown on the attached details.
10. Sedimentation Control Bales: Sedimentation control haybales shall be as described in the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 latest revision, under Section 2.18. Sedimentation control haybales shall be installed where required or as directed by the engineer. Materials and construction methods shall be as described and in accordance with the above reference State of Connecticut Standard Specifications.
11. Turf Establishment: Turf establishment shall be as described in the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Form 816 latest revision, under Section 9.50. All the grass areas shown on the attached details, areas disturbed during construction and other areas as may be directed by the City shall be treated with turf establishment. Materials and construction methods shall be as described and in accordance with the above reference State of Connecticut Standard Specifications.

#### **D. "RECLAIMING" OF BITUMINOUS PAVEMENT**

Description: This work shall consist of the reclaiming; milling, removal of large sections of pavement, and stockpiling of only reclaimed (ground-up asphalt). The City Highway Department shall load on to their trucks all excess Reclaimed Material (no pieces of pavement or concrete large and 1 1/2" in diameter shall be piled with the excess reclaimed material). It shall be

performed in accordance with these general specifications and in conformity with the line, grade, and typical cross-section shown on the plans.

**Reclaiming Equipment:** The equipment for reclaiming the pavement surface shall be designed and built for milling flexible pavements and shall have a minimum 6 foot cutting width. It shall be self propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing bituminous concrete pavement to the line, grade, and typical cross-section shown on the plans.

The reclaiming machine shall be equipped with a built in automatic grade control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line, ski (30 feet minimum), mobile string line (30 feet minimum), or matching shoe. The transverse controls shall have an automatic system for controlling cross-slope at a given rate.

The machine shall be capable of operating at a minimum speed of 10 feet per minute and be able to provide a 0 to 12 inch deep cut (minimum) in one pass. It shall be designed so that the operator can at all times observe the milling operation without leaving the control area of the machine.

The teeth on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being reclaimed from the surface of the roadway and discharge the millings into a truck, if not needed on site, all in one operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation in accordance with local, State, and Federal air pollution control laws and regulations.

When milling smaller areas or areas where it is impractical to use the above described equipment, the use of a smaller or lesser equipped milling machine may be permitted, when approved by the Engineer.

A sweeper equipped with a water tank, spray assembly to control dust, a pick-up broom, a dual gutter broom, and a dirt hopper shall be provided by the Contractor. The sweeper shall be capable of removing millings and loose debris from the textured pavement. Other sweeping equipment may be provided in lieu of the sweeper, when approved by the Engineer.



Construction Methods: The pavement surface shall be removed to the line, grade, and typical cross-section shown on the plans. The milling operation shall proceed in accordance with the specification contained in this document. The reclaimed surface shall provide a satisfactory riding surface with a uniform textured appearance. The reclaimed surface shall be free from gouges, excessive longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment, or poor workmanship. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer. When removing a bituminous concrete pavement from an underlying Portland cement concrete pavement, all of the bituminous concrete pavement shall be removed to the greatest extent practicable, leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer.

Unless otherwise specified, milling shall be done to improve rideability and/or cross-slope. The existing pavement shall be removed to the average depth shown on the plans, in a manner that will restore the pavement surface to a uniform cross-section and longitudinal profile. The longitudinal profile of the milled surface shall be established by a stringline, mobile stringline, or mobile ski. The cross-slope of the milled surface shall be established by a second sensing device or by an automatic cross-slope control mechanism. The Contractor will be responsible for providing all grades necessary to remove the material to the proper line, grade, and typical cross-section shown on the plans. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm sewer system the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed by the Contractor at the Contractor's expense.

At all permanent limits of milling, a clean vertical face shall be established prior to paving. No vertical faces, transverse or longitudinal, shall be left exposed to traffic.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper or other approved equipment to remove, to the greatest extent practicable, material which will become airborne under

traffic. This operation shall be conducted in a manner so as to minimize the potential for creation of a traffic hazard and to comply with local, State, and Federal air pollution control laws and regulations. Any damage done to traffic as a result of milled material becoming airborne is the responsibility of the Contractor and shall be repaired at the Contractor's expense.

The reclaimed surface will be tested by the Engineer with a 10 foot straightedge furnished by the Contractor. The variation of the top of ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed  $3/8$ ". The variation of the top of any ridge from the bottom of the groove adjacent to that ridge shall not exceed  $3/8$ ". Any point in the surface not meeting these requirements shall be corrected as directed by the Engineer at the Contractor's expense.

The Contractor may be waived of the straightedge surface requirements stated in the preceding paragraph in areas where a surface lamination between bituminous concrete layers or a surface lamination of bituminous concrete on Portland cement concrete causes a non-uniform texture to occur. This is subject to the approval of the Engineer.

**Method of Measurement:** This work will be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

The depth of removal will be verified by taking a measurement every 100 feet per each pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to calculate the average depth of removal. This average depth will be used as the depth for payment. No additional payments will be made for multiple passes with the milling machine to remove the bituminous surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled transition; removal and disposal of millings; furnishing a sweeper and sweeping after milling. The costs for these items shall be included in the contract unit price.

**E. PLACEMENT OF WEARING SURFACE ON EXISTING PAVEMENT OR BINDER COURSE**

A "tack coat" approved by the City of Danbury is required to be applied on top of any existing pavement or new binder course pavement (unless the new binder course is determined by the City of Danbury to still be hot) before placing the wearing surface pavement course. Tack coat material (brand) and method of application are to be approved by the City prior to said application.

A "notched wedge joint" is to be constructed between the two courses of pavement (see detail).

**F. DISTURBED AREAS**

All existing sidewalks, curbs, asphalt pavement, grass areas, driveway aprons, driveway ramps, etc. which are disturbed during the course of construction shall be restored to their original conditions at no additional cost to the City. The Contractor shall take into account the cost of such restoration in the preparation of his/her item bid prices. The City will not entertain any requests for extra payment for restoration work.

**G. WEATHER**

No concrete shall be placed or curbs set in inclement weather. The Contractor shall not place any concrete, if the temperature is 40 degrees F and falling. Contractor shall have sufficient covers on hand to be used to cover freshly placed concrete in case of sudden rain. Any concrete damaged by the elements for any reason shall be rejected and replaced by the Contractor at no additional cost to the City.

**H. PROTECTION AND DAMAGE**

- a. The Contractor shall at all times properly protect private and City structures, equipment, furnishings, and employees from injury or damage by providing sufficient drop cloths, covers, pads, barricades, signs, etc.
- b. Any damage caused by the Contractor shall be promptly repaired by the Contractor in an approved manner to match the original conditions at no additional cost to the City.

**I. RUBBISH/DEBRIS**

- a. The Contractor shall daily remove from the premises all rubbish resulting from the execution of his/her daily work, and shall clean the work area to a broom clean condition at the end of each day.
- b. All sidewalk and curb demolition materials, as well as excess base material, shall be removed from the site and properly disposed of at the Contractor's expense.

- c. On completion of the work, all debris and surplus materials shall be promptly removed and the area left in a broom clean condition.

**J. COMPLETE JOB INTENDED**

The Contractor shall provide a proper and complete job in all respects. Any work not specifically mentioned in these specifications, but obviously required for a complete and workmanlike job, shall be deemed to have been included in the Proposal items and at no additional cost to the City.

**K. PAYMENT**

- a. Included in the unit prices bid for each proposed bid item shall be all work required to complete the work intended, including but not limited to saw cutting, processed aggregate, installation of reinforcement, placement of concrete, testing, expansion joints, scoring, connections to existing walkways and driveways, curbing, fill, topsoil, seeding, mulching, application of salt guard sealing compound, etc.
- b. Payment for traffic control (Bid Item No. 7A), with the exception of payment for the cost of Danbury police officers, is to be included in the unit prices bid for each proposal item. Where Danbury police officers are required, as determined by the Police Department and City Engineer, the Contractor is responsible for arranging police officer service with the Danbury Police Department. The City will pay, as a direct cost, the amount of the invoice sent to the Contractor by the Danbury Police Department, with no adjustment by the Contractor for handling the invoice.



P.O. Box 3  
North Billerica, MA 01862

## INSTALLATION PROCEDURE

### ADA REPLACEABLE (WET-SET) COMPOSITE UNITS FOR COMMERCIAL APPLICATIONS

1. **Submittals/Approvals:** Contractor will not be allowed to install ADA Replaceable (Wet-Set) Composite Unit (ADAREP) until all submittals have been reviewed and approved by the Engineer.
2. **Truncated Dome Alignment:** When successive ADAREP Units are installed, or when cutting to a radius, take care to insure that the truncated domes are properly aligned (to the maximum extent possible) for the best possible function and architectural finish.
3. **Concrete Substrate:** Generally, the ADAREP Unit shall be installed when the slump value of the concrete substrate is in the 4 – 7 range. The ADAREP Unit is best installed in a somewhat "stiff" concrete mix. Excessively "wet" concrete mixes are undesirable.
4. **Installation:** The ADAREP Units shall be tamped with a rubber mallet (Avoid striking directly by using a cut 2"x4" piece of wood) or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of the ADAREP unit is flush to the adjacent concrete surface, or as the drawings indicate, to permit proper water drainage and to eliminate tripping hazards between adjacent finishes.
5. **Maintain a Level Profile:** Depending upon the "stiffness" of the concrete mix, it is possible that there might be a minor tendency of successive ADAREP Units to float slightly relative to one another. If and when such a condition arises, and to insure that ADAREP Units are level relative to one another, place a small piece of plywood (to distribute the load) with suitable weight on it to span the joint line between successive ADAREP Units. The weight may be removed once initial set of the concrete is achieved.
6. **Spacing:** The Installer must leave a 1/8" nominal gap between successive ADAREP Units. UNDER NO CIRCUMSTANCES SHALL SUCCESSIVE ADAREP UNITS BE INSTALLED WITHOUT THE 1/8" NOMINAL JOINT OR ALLOWED TO OVERLAP.
  - A. **Plastic Joint Materials:** To insure that a uniform 1/8" wide nominal joint is created between successive ADAREP Units, use 1/8" PLASTIC TILE SPACERS, as manufactured by Superior Bilt or equal, between successive ADAREP Units – this is the preferred approach. Alternatively, a plastic joint material such as "SPEED-E-JOINT" ("Zip-Strip"), as manufactured by W.R. Meadows, Inc., may be installed between successive ADAREP Units. Equivalent joint materials/systems may be



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used so long as a uniform 1/8" wide joint is created and so long as sealant may be properly applied to the 1/8" wide nominal joint.

7. **Perimeter Edge Treatment:** As part of the concrete finishing operation, the Installer shall use a 1/4" edging tool to create a 1/4" edge treatment around the perimeter of the ADAREP Units to facilitate future replacement of the ADAREP Units.
  - A. **Successive ADAREP Units:** Installer shall also clean out the 1/8" wide (nominal) joint between successive ADAREP Units so as to allow for proper application of sealant material. The joint may be cleaned out with an edging tool, tile spacer, or similar device.
8. **Apply Urethane Sealant for Water Tight Performance:** Once the concrete has cured sufficiently, and the substrate is determined to be dry, a Urethane Sealant such as Sikaflex1a or BASF Sonneborn NP1 shall be applied to the edge treatment and joints between successive ADAREP Units for a watertight ADAREP Unit installation. For optimal performance, prior to applying the sealant, inspect the ADAREP installation to insure that water from a recent cleaning operation or rain event hasn't collected around or underneath the ADAREP Unit. In the event that water is coming out from underneath the ADAREP Unit, remove the ADAREP Unit(s) and dry the underlying substrate using a blower – or for maximum speed a propane powered weed torch. Based upon the caulking skills of the Installer, the Installer may wish to mask at least the joint between successive ADAREP Units to insure that a sealant bead, with pleasing uniform architectural appearance, is applied between successive ADAREP Units.
9. **Cutting ADAREP Units:** ADAREP Units may be cut to desired size and configuration with a marble tip or diamond tip blade using a table saw or equivalent cutting device. The structural integrity of the ADAREP Unit is not compromised by cutting.
  - A. **Grinding Truncated Domes:** When cutting through truncated domes, Installer shall use a mini-grinder to grind smooth (to the maximum extent practicable) all cut truncated domes. The Installer may also grind cut truncated domes between successive ADAREP Units as necessary for optimal fit, appearance, and function.
  - B. **Layout for Radial Application:**
    1. **Wedge Approach:** Installer may elect to cut an appropriate number of ADAREP Units into wedge shapes suitable to "step around" the desired radius.

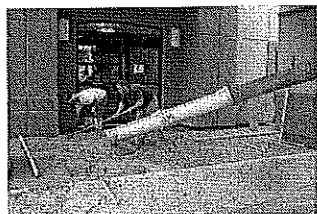


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2. **"Cut To Fit":** Installer may wish to modify 3'x4' or 3'x5' ADAREP Units into "single piece" radial units to conform more precisely to the desired radius.
10. **Creating Additional Anchor Location(s):** All anchor locations on the ADAREP Unit are located five inches inside of the perimeter of the ADAREP Unit. In the event you cut off an anchor when cutting to fit, please follow the procedure below, prior to installation:
- A. **"Countersink Kit":** Installer may purchase from ADA Solutions, Inc., a Countersink Kit consisting of a 7/8", 82\*, 6pt countersink bit along with hex drive 1/2 " flat head, stainless steel bolt(s), and anchors. (Caps are not used for these fastener locations).
- B. **Countersink:** Using the countersink bit, carefully countersink a new fastener hole in the desired location between the truncated domes. Do not countersink any deeper than where the countersink bit begins to go vertical. There is just enough depth in the body of the ADAREP Unit to accommodate a new anchor.
- C. **Inspection:** Prior to installing the ADAREP Unit, confirm that the flathead bolt supplied by ADA is properly and flush seated within the newly created anchor hole location.
11. **Removal of Plastic Cover:** The ADAREP Unit is supplied with a protective plastic cover to protect the ADAREP Unit from construction debris and equipment until ready to place into commercial service. In the event of high UV and temperature exposure, please remove the protective plastic cover as soon as the concrete has cured sufficiently so that the protective plastic cover does not become bonded to the ADAREP Unit.

**PRODUCT SIZES:**  
**APPLICATION:**

24"x36", 24"x48", 24"x60", 36"x48", and 36"x60"  
Fresh Pour Concrete Ramps or Platforms



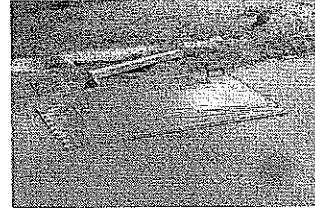
**POUR**



**PLACE**



**TAMP**



**DONE!**



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## ADA REPLACEABLE (WET-SET) COMPOSITE DETECTABLE WARNING SURFACE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Americans with Disabilities Act (ADA) Title 49 CFR Transportation, Part 37.9 Standards for Accessible Transportation Facilities, Appendix A, Section 4.29.2 Detectable Warnings on Walking Surfaces. ADA and ABA Accessibility Guidelines for Buildings and Facilities (7/23/04, amended 8/5/05): Sections 218, 405, 406, 705, and 810. Revised Draft Guidelines for Accessible Public Rights of Way (11/23/05): Sections R221, R303, R304, R305, R308, and R414.
- C. California Code of Regulations (CCR 2001) Title 24 Part 1 Articles 2, 3 and 4, and Part 2 Section 205 definition of "Detectable Warning", Section 1127B.5 for "Curb Ramps", and Section 1133B.8.5 for Detectable Warnings at Hazardous Vehicle Areas". Division of the State Architect IR 11B□3 (1/26/05) and IR 11B□4 (12/8/05).
- D. American Society for Testing and Materials (ASTM) Test Methods B117, C1028, D543, D570, D638, D695, D790, D1308, G151, G155, and E84.

#### 1.2 SECTION CONTENTS

- A. Description
- B. Related Work Specified Elsewhere.
- C. Submittals
- D. Quality Assurance.
- E. Delivery, Storage & Handling
- F. Site Conditions
- G. Extra Stock
- H. Warranty
- I. Materials.
- J. Installation.
- K. Cleaning & Protecting
- L. Manufacturer Information

#### 1.3 DESCRIPTION

- A. Specifications for the ADA Replaceable (Wet-Set) Composite detectable warning unit [ADAREP], in an in-line truncated dome pattern, embedded in all curb ramps, and





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walking surface at the locations and dimensions shown on the drawings, in accordance with the contract documents and as directed by the engineer.

#### 1.4 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specifications Section, apply to this Section.

#### 1.5 SUBMITTALS

- A. Product Data: Manufacturer's literature describing product and installation procedures.
- B. Samples for Verification Purposes: Submit three (3) samples of the tactile unit of the kind proposed for use.
- C. Shop drawings are required for products specified showing fabrication details; tile surface profile; plans of mat placement including joints, and material to be used as well as outlining installation materials and procedure.
- D. Material Test Reports: Submit current test reports from a qualified accredited independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated and in accordance with ASTM guidelines.
- E. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of tactile tile and accessory as required.
- F. Contractor will not be allowed to install ADAREP until all submittals have been reviewed and approved by the Engineer.

#### 1.6 QUALITY ASSURANCE

- A. Provide ADAREP units and accessories as produced by a single manufacturer.
- B. Installer's Qualifications: Engage an experienced Installer qualified for installation, who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
- C. Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).



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#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. ADAREP units shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings, and shall be identified by model designation or number. ADAREP units shall be kept dry and away from sources of heat. Store on flat level surface.
- B. ADAREP shall be delivered to location at building site for storage prior to installation.

#### 1.8 SITE CONDITIONS

- A. Provide barricades or screens to protect passengers or public.

#### 1.9 EXTRA STOCK

- A. Deliver extra stock to the Owner. Furnish new materials from same manufactured lot as materials installed with appropriate identification, and protective packaging. Furnish not less than two or (10)% of the supplied materials for each type, color and pattern installed.

#### 1.10 WARRANTY

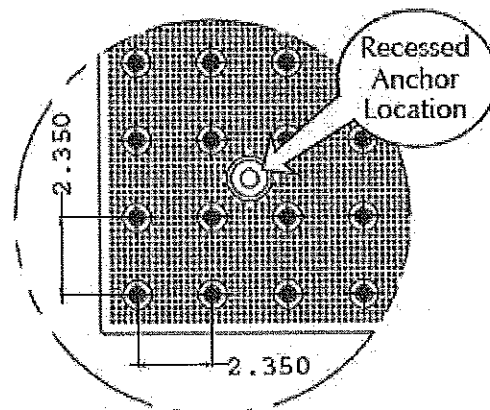
- A. ADAREP units shall be guaranteed in writing for a period of five (5) years from date of Contract's final completion. The warranty includes defective work, breakage, deformation, and loosening of tactile warning surface material.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. ADAREP units shall be manufactured using a matte finish exterior grade homogeneous (uniform color throughout) glass and carbon reinforced polyester based SMC material.
- B. Color and UV stabilization is uniform throughout, and does not rely on any type of paint coating.

- C. Square grid pattern of raised truncated domes measuring 0.2 inches nominal height, base dome diameter of 0.90", top dome diameter of 0.45" inches.
- D. Truncated domes shall have a center-to-center (horizontally and vertically) spacing of 2.35 inches, measured between the most adjacent domes on a square grid. (see drawing)
- E. ADAREP units include embedded corrosion resistant 1.50" zinc inserts with 1/2" diameter stainless steel fasteners.
- F. Recessed anchor system is embedded in the body of the unit, between the domes, and does not rely on, or integrate with, domes as fasteners.
- G. Anchor bolts are covered by a water-tight, pressure fitted, plug with surface texture and color to match remainder of the tile.
- H. The field area shall consist of a non-slip textured surface with a minimum static coefficient of friction of 0.80, wet and dry.
- I. ADAREP units shall measure 3/8" thickness (nominal) exclusive of 5/8" thick x 1" wide perimeter flange detail.



## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Truncated Dome Alignment: When successive ADAREP Units are installed, or when cutting to a radius, take care to insure that the truncated domes are properly aligned (to the maximum extent possible) for the best possible function and architectural finish.
- B. Concrete Substrate: Generally, the ADAREP Unit shall be installed when the slump value of the concrete substrate is in the 4 – 7 range. The ADAREP Unit is best installed in a somewhat "stiff" concrete mix. Excessively "wet" concrete mixes are undesirable.
- C. Installation: The ADAREP Units shall be tamped with a rubber mallet (Avoid striking directly by using a cut 2"x4" piece of wood) or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of the ADAREP unit is flush to the adjacent concrete surface, or as the drawings indicate, to permit proper water drainage and to eliminate tripping hazards between adjacent finishes.
- D. Maintain a Level Profile: Depending upon the "stiffness" of the concrete mix, it is possible that there might be a minor tendency of successive ADAREP Units to float slightly relative to one another. If and when such a condition arises, and to insure that ADAREP Units are level relative to one another, place a small piece of plywood (to



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distribute the load) with suitable weight on it to span the joint line between successive ADAREP Units. The weight may be removed once initial set of the concrete is achieved.

- E. Spacing: The Installer must leave a 1/8" nominal gap between successive ADAREP Units. UNDER NO CIRCUMSTANCES SHALL SUCCESSIVE ADAREP UNITS BE INSTALLED WITHOUT THE 1/8" NOMINAL JOINT OR ALLOWED TO OVERLAP.
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- F. Perimeter Edge Treatment: As part of the concrete finishing operation, the Installer shall use a 1/4" edging tool to create a 1/4" edge treatment around the perimeter of the ADAREP Units to facilitate future replacement of the ADAREP Units.
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- H. Cutting ADAREP Units: ADAREP Units may be cut to desired size and configuration with a marble tip or diamond tip blade using a table saw or equivalent cutting device. The structural integrity of the ADAREP Unit is not compromised by cutting.
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  2. Layout for Radial Application:
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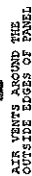
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- b. "Cut To Fit": Installer may wish to modify 3'x4' or 3'x5' ADAREP Units into "single piece" radial units to conform more precisely to the desired radius.
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    - 2. Countersink: Using the countersink bit, carefully countersink a new fastener hole in the desired location between the truncated domes. Do not countersink any deeper than where the countersink bit begins to go vertical. There is just enough depth in the body of the ADAREP Unit to accommodate a new anchor.
    - 3. Inspection: Prior to installing the ADAREP Unit, confirm that the flathead bolt supplied by ADA is properly and flush seated within the newly created anchor hole location.
  - J. Removal of Plastic Cover: The ADAREP Unit is supplied with a protective plastic cover to protect the ADAREP Unit from construction debris and equipment until ready to place into commercial service. In the event of high UV and temperature exposure, remove the protective plastic cover as soon as the concrete has cured sufficiently so that the protective plastic cover does not become bonded to the ADAREP Unit.
- 3.2 CLEANING AND PROTECTING
- A. Protect ADAREP against damage during construction period to comply with manufacturer's specification.
  - B. Protect ADAREP against damage from rolling loads following installation by covering with plywood.
  - C. Clean ADAREP by method specified by the manufacturer.

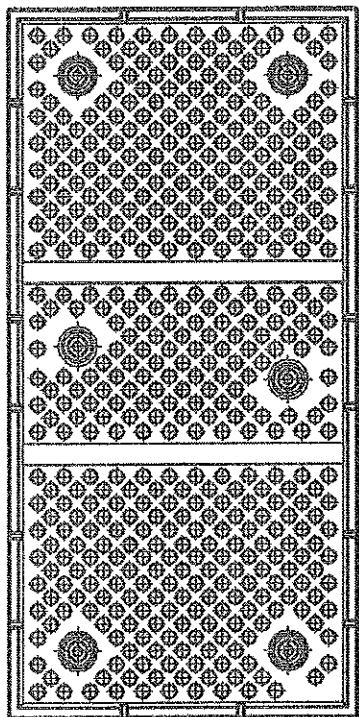
## PART 4 – MANUFACTURER INFORMATION

### 4.1 MANUFACTURERS

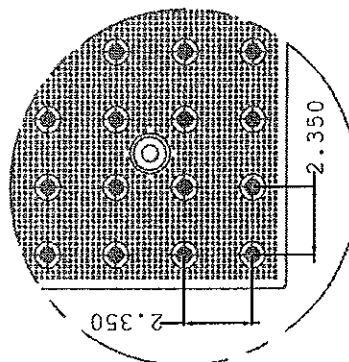
- A. Available manufacturers, subject to compliance with these specifications include, but are not limited to the following:
  - 1. ADA Solutions, Inc., P.O. Box 3, N. Billerica, MA 01862, or approved equal.



SIDE VIEW



BOTTOM VIEW



VIEW - " D" 2 x SIZE  
FIELD DOT 7 DOME LAYOUT

US PATENT PENDING

MATERIAL LIST		PART NO.		CT'	
ITEM	DESCRIPTION				
1					
2					
3					
4					
25 IN WIDE 30 IN HIGH FULL SIZE		PART NO. 100		CT' 100	
MATERIAL 100		PART NO. 100		CT' 100	

## CONCRETE MIX DESIGN SUBMITTAL

DATE:  
CONTRACTOR:  
CONTACT:  
PROJECT:

STRENGTH (ASTM C31 LABORATORY CURED): 4500 PSI  
PRODUCT CODE: 7015  
PRODUCT DESCRIPTION: STATE CLASS C 4500

### NOTATIONS:

1. MIX DESIGNED IN ACCORDANCE WITH ACI 318-05 AND, 301-99, AND CONNECTICUT DOT SPECIFICATIONS.
2. ADMIXTURE DOSAGES MAY VARY ACCORDING TO FIELD CONDITIONS.
3. PLEASE REFER TO PRODUCT CODE EACH TIME AN ORDER IS PLACED.
4. IN THE EVENT THAT GRANCEM BECOMES UNAVAILABLE, IT WILL BE REPLACED WITH PORTLAND TYPE I/II CEMENT.
5. IN PERIODS OF COOLER WEATHER, THE AMOUNT OF GRANCEM WILL BE REDUCED TO 15% OF THE TOTAL CEMENTITIOUS MATERIAL. THE TOTAL CEMENTITIOUS MATERIAL WILL REMAIN THE SAME.

### BATCH WEIGHTS PER CUBIC YARD

CEMENT (ASTM C150 TYPE I/II)	494 LBS
GRANCEM (GGBFS)	211 LBS
SAND (ASTM C33) SSD	1225 LBS
ASTM № 67 STONE (¾")	1760 LBS
WATER	37 GALS
AIR MIX 200	0.5±0.2 OZ/CWT
PLASTOL 341	2.0 OZ/CWT
AIR CONTENT	5-7%
SLUMP	1-3"

### A MINIMUM BATCH OF 3 CYD IS REQUIRED

**ADMIXTURES:** ALL EUCLID CHEMICAL COMPANY, CLEVELAND, OHIO

1. WATER REDUCER-PLASTOL 341
2. AIR ENTRAINING AGENT-AIR MIX 200

**OPTIONAL ADMIXTURES:** TO BE USED WHEN REQUESTED BY FIELD PERSONNEL IN PLACE OF PLASTOL 341

1. NON-CHLORIDE ACCELERATOR-ACCELGUARD 80-16-24 OZ/CWT
2. RETARDER-EUCON RETARDER 75-2-4 OZ/CWT
3. SUPERPLASTICIZER-EUCON 37-10.0 OZ/CWT
4. NO AIR CONCRETE-ALL MIXES SUBMITTED FOR THIS PROJECT INCLUDE ENTRAINED AIR. ENTRAINED AIR WILL BE OMITTED ONLY ON REQUEST. THIS WILL RESULT IN 0-3% ENTRAPPED AIR IN THE MIX. IT IS RECOMMENDED TO OMIT AIR ENTRAINMENT IN SOME INTERIOR SLABS.
5. HOT WEATHER CONCRETE: RETARDER SHALL BE SUBSTITUTED FOR WR-91 WHEN THE MIX TEMPERATURE IS EXPECTED TO EXCEED 80°F, THIS IS FOR BASIC WATER REDUCTION ONLY. FOR SET RETARDATION, OPTIONAL ADDITIONAL RETARDER IS AVAILABLE UPON REQUEST.

SUBMITTED BY:

**CONSOLIDECK®**  
HIGH-PERFORMANCE CONCRETE

# Saltguard® WB

*deeply penetrating water & salt barrier for concrete*

## OVERVIEW

Consolideck® Saltguard® WB is a ready-to-use water-based, VOC compliant silane/siloxane water repellent and "chloride screen" for the protection of concrete and masonry. Saltguard® WB penetrates more deeply than conventional water- or solvent-based water repellents. Low odor and alkaline stable, Saltguard® WB is ideal for field or in-plant application to concrete and most masonry. Saltguard® WB protects horizontal and vertical surfaces from moisture intrusion and chemical attack of chloride salts.

In coastal areas, Saltguard® WB protects against salt air by screening chlorides from penetrating through concrete to the reinforcing steel. Saltguard® WB reduces rebar corrosion and surface spalling caused by water-carried salts. Use Saltguard® WB on horizontal surfaces such as driveways, sidewalks, tile or brick pavers. Provides excellent protection for retaining walls, bridge pilings and other vertical areas exposed to de-icing salts.

Saltguard® WB is a ready-to-use effective alternative to conventional solvent-based silanes and siloxanes. Saltguard® WB penetrates and chemically bonds deep within the concrete or masonry substrate to provide long-lasting protection against moisture intrusion and water-related staining or deterioration. Properly applied, Saltguard® WB produces no surface film. Treated surfaces keep their natural breathing characteristics and natural appearance.

## SPECIFICATIONS

For all PROSOCO product specifications visit [www.prosoco.com](http://www.prosoco.com) and click on "SpecBuilder" or "Solution Finder."

## ADVANTAGES

- Penetrates to produce long-lasting protection on vertical or horizontal surfaces.
- Water-based formula minimizes explosion and fire hazards associated with alcohol- or solvent-based water repellents.
- Easy soap-and-water cleanup from window glass, window frames and application equipment.
- Low odor reduces risk of application to occupied buildings.
- Alkaline stable — suitable for new "green" concrete, 14-28 days old.
- Treated surfaces "breathe" — does not trap moisture.
- Effective protection against de-icing salts and salt air.
- Complies with all known national, state and district AIM VOC regulations.

## Limitations

- Not suitable for protecting surfaces subject to constant water spray (car washes).
- Not suitable for application to coated surfaces or surfaces previously treated with water repellents or liquid hardeners.
- Will not prevent water penetration through structural cracks, defects or open joints.
- Water repellency of treated surfaces will increase for up to 14 days after application.
- Saltguard® WB is not suitable for application to synthetic resin paints, gypsum, or other non masonry surfaces. The product may not be suitable for surfaces to receive paints or coatings. Always test for compatibility.

## REGULATORY COMPLIANCE

### VOC Compliance

Consolideck® Saltguard® WB is compliant with the following national, state and district AIM VOC regulations

- ☒ US Environmental Protection Agency
- ☒ California Air Resources Board SCM Districts
- ☒ South Coast Air Quality Management District
- ☒ Maricopa County, AZ
- ☒ Northeast Ozone Transport Commission

## TYPICAL TECHNICAL DATA

FORM	white liquid
SPECIFIC GRAVITY	0.997
pH	7-8
WT/GAL	8.24 lbs
ACTIVE CONTENT	10%
TOTAL SOLIDS	9%
VOC CONTENT	<400 g/L <120 g/L low solids
FLASH POINT	>212°F (>100°C)
FREEZE POINT	32°F (0°C)
SHELF LIFE	1 year in unopened, factory-sealed container



# Saltguard® WB

**PRODUCT DATA SHEET**  
**PROSOCO**  
SINCE 1939

## PERFORMANCE TESTS

Laboratory testing has shown this product to be a singularly effective general purpose water repellent/chloride screen. All tests were compared to untreated control.

### NCHRP 244 Series II

- Reduction of Water Absorption 88%
- Reduction in Chloride Ion Absorption 86%

### ASTM E 514 Wind-Driven Rain

- Reduction in Water Absorption 91%

### ASTM C 672 Scaling Resistance Exposure To De-Icing Chemicals & Freeze/Thaw Cycles (50 cycles)

- Cumulative Mass Loss no mass loss
- Scaling Resistance no scaling

### Resistance To:

- Sunlight Excellent
- Alkalinity Excellent

### Surface Appearance (after application)

No change

## PREPARATION

Protect people, property, vehicles and all surfaces not set for treatment from spray, wind drift and fumes. Protect and/or divert pedestrian and auto traffic. Though Saltguard® WB has very little odor, avoid exposing building occupants to fumes. Maintain adequate ventilation when working on interior surfaces.

Thoroughly clean the surface using the appropriate Consolideck®, Sure Klean® or Enviro Klean® product. Remove any curing compound or previous sealer. Contaminants on the surface, including curing compounds and previous sealers, may interfere with Saltguard® WB's ability to penetrate the surface. Though Saltguard® WB may be applied to slightly damp surfaces, best performance is achieved on clean, visibly dry and absorbent surfaces. Excessive

moisture inhibits penetration and reduces the service life and performance of the treatment. Clean newly constructed and repointed surfaces before application. Saltguard® WB won't impair adhesion of most sealing and caulking compounds. Always test for compatibility.

Protect window glass before using Saltguard® WB. Sure Klean® Strippable Masking is effective protection for use with this product. If protecting windows is impractical, follow these steps:

1. Clean window glass thoroughly before applying Saltguard® WB to nearby concrete or masonry.
2. Do not use Saltguard® WB in wind or when air or surface temperatures are hotter than 95°F (35°C).
3. Try to keep Saltguard® WB off the glass.
4. After treated surfaces have been protected from water for 6 hours, if product is on window glass, clean as soon as possible with soap and warm water. Alternatively use Enviro Klean® 2010 All Surface Cleaner to remove dried residues within 3–5 days.

## Surface and Air Temperatures

Must be at least 40°F (4°C) during application and for 8 hours following. Surface and air temperatures should not exceed 95°F (35°C). Higher temperatures evaporate the water carrier, reducing penetration.

If freezing conditions exist before application, let masonry thaw thoroughly. Subfreezing temperatures will freeze/crystallize Saltguard® WB, inhibiting penetration and significantly impairing results.

## Equipment

Apply with brush, roller or low-pressure spray (<50 psi). Fan tips are recommended for sprayers. Do not atomize.

## ALWAYS TEST

**ALWAYS TEST** a small area of each surface to confirm suitability and desired results before starting overall application. Test with the same equipment, recommended surface preparation and application procedures planned for general application.

## Storage and Handling

Store in a cool, dry place. Always seal container after dispensing. Do not alter or mix with other chemicals. Published shelf life assumes upright storage of factory-sealed containers in a dry place. Maintain temperature of 45–100°F (7–38°C). Keep from freezing. Do not double stack pallets. Dispose of unused product and container in accordance with local, state and federal regulations.

## APPLICATION

Before use, read "Preparation" and "Safety Information."

**ALWAYS TEST** each type of surface and coating for suitability and results before overall application. Test using the following application instructions. Let test area dry thoroughly before inspection.

## Dilution

Do not dilute or alter material, or use for purposes other than specified. Mix well before applying.

## Coverage Rates

Coverage varies based on substrate porosity and texture. Always test.

- 100–300 square feet per US gallon
- 9–28 square meters per US gallon

# Saltguard® WB

## Vertical Application Instructions

For best results, apply "wet-on-wet" to a visibly dry and absorbent surface.

**Spray:** saturate from the bottom up. Apply enough for a 4–8" (15–20 cm) rundown below the spray contact point. Let the first application penetrate for 5–10 minutes. Reapply in the same saturating manner. Less material will be needed for the second application. **NOTE:** When spray applying to fluted architectural block, spray in an "overlapping X pattern" for complete coverage of recessed surfaces.

**Brush or Roller:** apply uniformly. Saturate the surface. Let product penetrate for 5–10 minutes. Brush out heavy runs and drips that do not penetrate.

## Horizontal Application Instructions

1. Apply in a single saturating coat. Use enough to keep the surface wet for 2–3 minutes before penetrating. Do not over apply.
2. Broom out all puddles thoroughly until they penetrate the surface. Wipe up all excess material.

## Dense Surface Application Instructions

Apply a single coat. Use enough to completely wet the surface without creating drips, puddles or rundown. Do not over apply. Test for application rate.

Treated surfaces will dry to touch within 1 hour. Protect surfaces from rainfall for a minimum of 6 hours following treatment. Treated surfaces will be ready for pedestrian and vehicle traffic in 24 hours. Many surfaces may require several days to achieve their full water repellency properties.

## Cleanup

Clean tools, equipment and surfaces affected by over spray with soap and warm water.

## Paint Adhesion

Surfaces treated with Saltguard® WB may be coated with silicone emulsion paints and many oil-based paints. Always test to assure adhesion. Adhesion may be improved if surface is pressure-rinsed and allowed to dry before application. Adhesion of some cementitious coatings, plaster, stucco, etc. may be adversely affected. Such surface treatments should be installed and allowed to thoroughly cure before installation of Saltguard® WB. Always test to verify compatibility between Saltguard® WB and other proposed surface treatments.

## SAFETY INFORMATION

Consolideck® Saltguard® WB is a water-based product. Use appropriate safety equipment and job site controls during application and handling. Read the full label and MSDS for precautionary instructions before use.

## First Aid

**Ingestion:** Get medical assistance.

**Eye Contact:** Rinse thoroughly for 15 minutes. Get immediate medical assistance.

**Skin Contact:** Remove contaminated clothing and rinse thoroughly for 15 minutes. Seek medical assistance if persistent irritation develops.

**Inhalation:** Seek medical attention if irritation develops.

**24-Hour Emergency Information:**  
INFOTRAC at 800-535-5053

## BEST PRACTICES

Use the appropriate Consolideck® concrete prep cleaner to remove contaminants from existing concrete before applying Saltguard® WB. Stains and soiling may interfere with Saltguard® WB penetration.

For recommendations on removing stains and coatings, visit [www.prosoco.com](http://www.prosoco.com), call PROSOCO technical Customer Care toll-free at 800-255-4255 or contact your local PROSOCO field representative.

Always saturate the surface uniformly. Give the treatment a few minutes to penetrate, but brush out pools and puddles quickly.

Never go it alone. If you have problems or questions, contact your local PROSOCO distributor or field representative. Or call PROSOCO technical Customer Care, toll-free, at 800-255-4255.

# Saltguard® WB

**PRODUCT DATA SHEET**  
**PROSOCO**  
SINCE 1939

## **WARRANTY**

The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own tests to determine the suitability of such products for a particular purpose.

PROSOCO, Inc. warrants this product to be free from defects. Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for

particular purpose. The purchaser shall be responsible to make his own tests to determine the suitability of this product for his particular purpose. PROSOCO's liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

## **CUSTOMER CARE**

Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-255-4255 and ask for Customer Care - technical support.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-255-4255, or visit our web site at [www.prosoco.com](http://www.prosoco.com), for the name of the Consolideck® representative in your area.



**PROSOCO**  
SINCE 1939

**Corporate Office**  
3741 Greenway Circle  
Lawrence, KS 66046  
800.255.4255  
785.865.4200  
fax 785.830.9016  
auto attendant  
800.491.0721  
customer care fax  
800.877.2700  
email  
prosoco@prosoco.com

## **Saltguard WB LEED Product Information**

Saltguard WB is a ready-to-use, water-based water repellent and chloride screen for the protection of concrete and masonry surfaces.

### ***LEED EQ Credit Conformance***

LEED NC 2.2 EQ Credit 4.2: The New Construction & Major Renovation Reference Guide Low-Emitting Materials section incorporates by reference the South Coast Air Quality Management District (SCAQMD) Rule 1113 in effect on January 1, 2004. Saltguard WB is classified as a Low Solids Coating (limit 120 g/L).

PROSOCO certifies that Saltguard WB has a VOC content of 37 g/L and complies with Rule 1113.

### ***Manufacturing Location***

Lawrence, Kansas

### ***Recycled Content***

Saltguard WB is manufactured with no post-consumer materials content.

***Date of Generation:*** August 18, 2009

***Certification by:*** Dwayne Fuhlhage, CHMM  
Regulatory Affairs Director



"LEED" is a trademark of the  
U.S. Green Building Council



PROSOCO is a proud member and supporter of  
NPCA's Coatings Care product stewardship initiative.

# MATERIAL SAFETY DATA SHEET



PROSOCO, Inc.

## I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME AND ADDRESS: PROSOCO, Inc.  
3741 Greenway Circle  
Lawrence, KS 66046

EMERGENCY TELEPHONE NUMBERS:  
8:00 AM – 5:00 PM CST Monday-Friday: 785/865-4200  
NON-BUSINESS HOURS (INFOTRAC): 800/535-5053

PRODUCT TRADE NAME: Consolideck® Saltguard® WB

## II HAZARDOUS INGREDIENTS

CHEMICAL NAME	(COMMON NAME)	CAS NO.	HMIS CODE	ACGIH TLV/TWA	OSHA PEL/TWA
Silane, triethoxyoctyl	(Proprietary)*	2943-75-1	1,2,0-	None established	None established

\*Specific chemical identity withheld as trade secret pursuant to OSHA regulations.

Hydrolysis by-products are present in product as supplied in minute concentrations. These materials evolve slowly during curing.

## III PHYSICAL DATA

	BOILING POINT (°F)	VAPOR PRESSURE (mm Hg)	VAPOR DENSITY (Air = 1)	EVAPORATION RATE (Butyl Acetate = 1)
Silane, triethoxyoctyl	212	ND	approx. 1	ND

	SPECIFIC GRAVITY	SOLUBILITY IN WATER	APPEARANCE AND ODOR
Consolideck® Saltguard® WB	0.997	100%	White liquid, odorless

## IV FIRE AND EXPLOSION HAZARD DATA

### EMERGENCY OVERVIEW

Consolideck® Saltguard® WB is a white, odorless, liquid. Contact with the eyes or skin may result in irritation. Always wear appropriate personal protective equipment when using this product.

FLASH POINT (METHOD): > 212°F (ASTM D 3278)

FLAMMABLE LIMITS: Not applicable.

EXTINGUISHING MEDIA: Foam, carbon dioxide, water spray.

SPECIAL FIRE FIGHTING PROCEDURES: None.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Although there is no flash point, flammable vapors may accumulate in the headspace of the container when storage times of six months are exceeded.

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## V HEALTH HAZARD DATA

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**PRIMARY ROUTES OF EXPOSURE:** Skin and eyes.

**CARCINOGEN INFORMATION:** Not listed (OSHA, IARC, NTP).

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** No applicable information found.

**EFFECTS OF OVEREXPOSURE:** Eye and skin irritation possible with direct contact.

**EYE CONTACT:** Causes eye irritation.

**SKIN CONTACT:** Causes skin irritation.

**INHALATION:** No harmful effects have been reported upon inhalation.

**INGESTION:** No harmful effects reported.

### **EMERGENCY AND FIRST AID PROCEDURES:**

**EYE CONTACT:** If in eyes, flush with large amounts of water for 15 minutes, holding eyelids apart to ensure flushing of the entire eye surface. Get medical attention.

**SKIN CONTACT:** Wash exposed area with soap and water. Remove contaminated clothing. If persistent irritation occurs, get medical attention. Launder contaminated clothing before reuse.

**INHALATION:** No respiratory effects have been reported.

**INGESTION:** Seek medical assistance.

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## VI REACTIVITY DATA

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**STABILITY:** Relatively non-reactive, but will hydrolyze slowly at ambient temperatures to form alcohol.

**CONDITIONS TO AVOID:** Heat, frost.

**INCOMPATIBILITY (MATERIALS TO AVOID):** Strong acids, oxidants, alkalis.

**HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:** After long periods of time, small amounts of alcohol may be formed in the container headspace.

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## VII SPILL OR LEAK PROCEDURES

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**SPILL, LEAK, WASTE DISPOSAL PROCEDURES:** Wear appropriate protective safety equipment. Control spill with absorbent pads or brooms. If necessary, apply granular or loose sorbent to spill. When absorbed, sweep or otherwise collect and dispose of properly. Floors may be slippery; care should be exercised to avoid falls.

**WASTE DISPOSAL METHODS:** Dispose of in a manner approved for this material. As of this writing, the product is not classified as a hazardous waste, however, federal regulation prohibits disposal of liquid materials of any kind in a sanitary landfill. Solidify cleanup residuals before disposal. As local and state regulations may vary, consult with appropriate state and local regulatory agencies or the sanitary landfill operator to ascertain proper disposal procedures.

Empty containers must not be reused. Drain all liquid possible from the container before disposal in a sanitary landfill.

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## VIII SPECIAL PROTECTION INFORMATION

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**RESPIRATORY PROTECTION:** Wear a NIOSH approved dust/mist respirator as necessary to avoid unnecessary inhalation of wind drift during application.

**VENTILATION:** Mechanical local exhaust at point of use.

**PROTECTIVE CLOTHING:** Wear protective clothing such as long sleeved work shirt and pants, work boots, and rubber gloves as needed to avoid skin contact. Do not allow clothing to become saturated with product. If work practices cannot be adjusted to avoid excess clothing saturation, splash resistant or Tyvek clothing and boots may be required.

**PROTECTIVE GLOVES:** Chemically resistant gloves such as nitrile, rubber, or PVC may be used.

**EYE PROTECTION:** Safety glasses with side shields are recommended. Splash resistant goggles or a face shield should be used prevent eye contact where wind-drift and excess atomization can pose a risk

**OTHER PROTECTIVE EQUIPMENT:** Access to an eyewash is recommended. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.133 and 29 CFR 19120. 132.

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## IX SPECIAL PRECAUTIONS

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**WORK PRACTICES:** Proper work practices and planning should be utilized to avoid contact with workers, passersby, and non-masonry surfaces. Do not atomize during application. Beware of wind drift. See the Product Data sheet and label for specific precautions to be taken during use. Wash hands before breaks and at the end of a shift.

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Wear appropriate safety equipment and clothing. Do not get in eyes, on skin, or on clothing. Do not take internally. Avoid breathing mist. Never touch face with hands or gloves that may be contaminated with this product.

Store in a cool, dry, well-ventilated place. Keep containers tightly closed when not dispensing product. Use care around spilled material because it will be slippery.

**OTHER PRECAUTIONS:** None known.

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## X REGULATORY INFORMATION

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**SHIPPING:** This product is not regulated for domestic or international shipment.

### SARA 313 REPORTABLE:

CHEMICAL NAME	CAS	UPPERBOUND CONCENTRATION % BY WEIGHT
NA	NA	NA

**CALIFORNIA PROPOSITION 65:** This product contains no chemicals listed under California's Proposition 65.

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**XI OTHER**

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**MSDS Status:**      **Date of Revision:** July 19, 2007  
                         **For Product Manufactured After:** August 1, 2007  
                         **Changes:** Updated Product Item #, Section XI  
                         **Item #:** 46067  
                         **Approved By:** Regulatory Department

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**DISCLAIMER:**

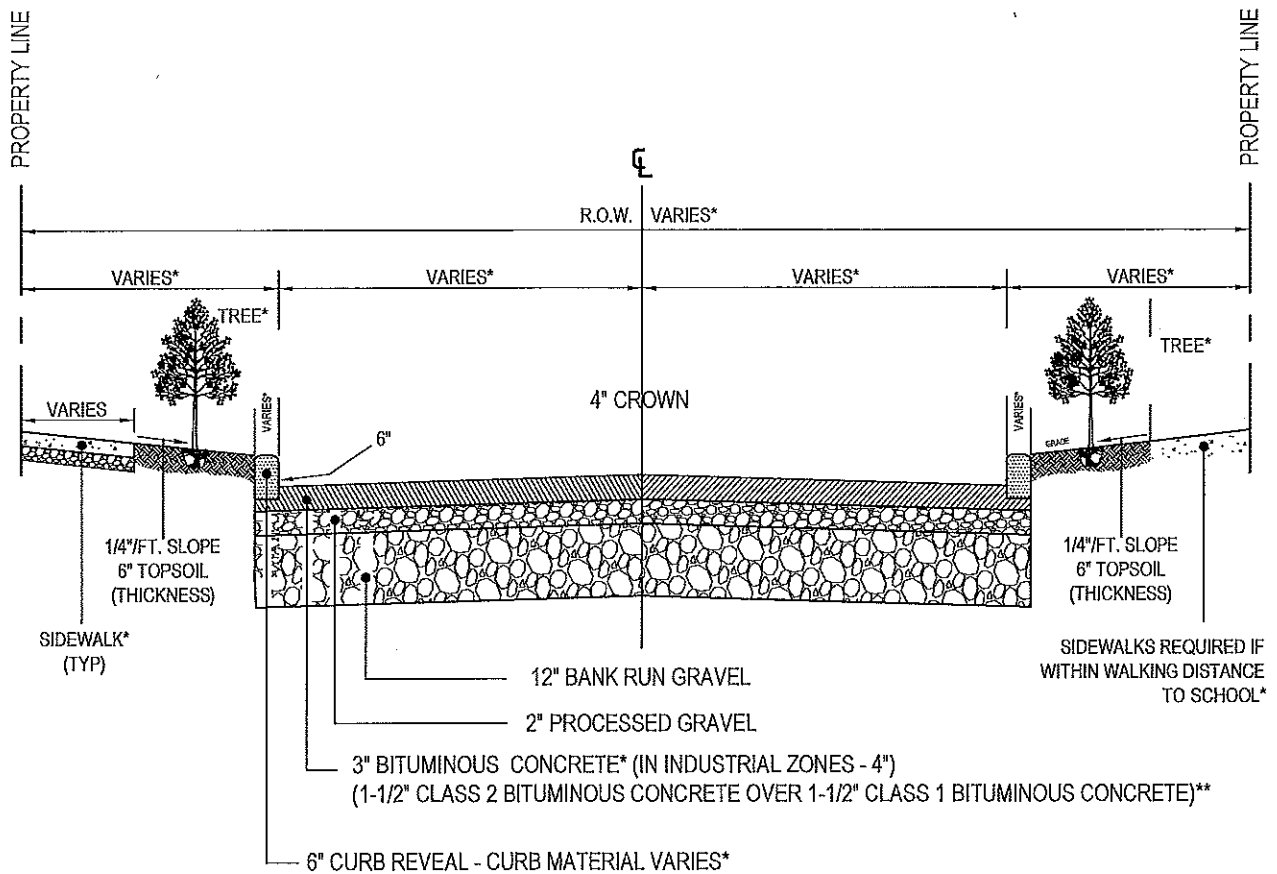
The information contained on the Material Safety Data Sheet has been compiled from data considered accurate. This data is believed to be reliable, but it must be pointed out that values for certain properties are known to vary from source to source. **PROSOCO, Inc. expressly disclaims any warranty express or implied as well as any liability for any injury or loss arising from the use of this information or the materials described.** This data is not to be construed as absolutely complete since additional data may be desirable when particular conditions or circumstances exist. It is the responsibility of the user to determine the best precautions necessary for the safe handling and use of this product for his unique application. This data relates only to the specific material designated and is not to be used in combination with any other material. Many federal and state regulations pertain directly or indirectly to the product's end use and disposal of containers and unused material. It is the purchaser's responsibility to familiarize himself with all applicable regulations.

**DATE OF PREPARATION:** August 1, 2007



# TYPICAL ROADWAY SECTION

REFER TO CITY OF DANBURY SUBDIVISION REGULATIONS FOR DIMENSIONS FOR DIFFERENT ROADWAY CLASSIFICATIONS



(NOT TO SCALE)

## NOTE:

\*PLEASE REFER TO THE CITY OF DANBURY SUBDIVISION REGULATIONS FOR DIFFERENT ROADWAY CLASSIFICATION REQUIREMENTS.

\*\* BITUMINOUS CONCRETE TO MEET STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION SPECIFICATION FORM 816 REQUIREMENTS

REVISIONS		
	DATE	By
1	6/10/2013	P.J.T.
2	12/3/2013	P.J.T.

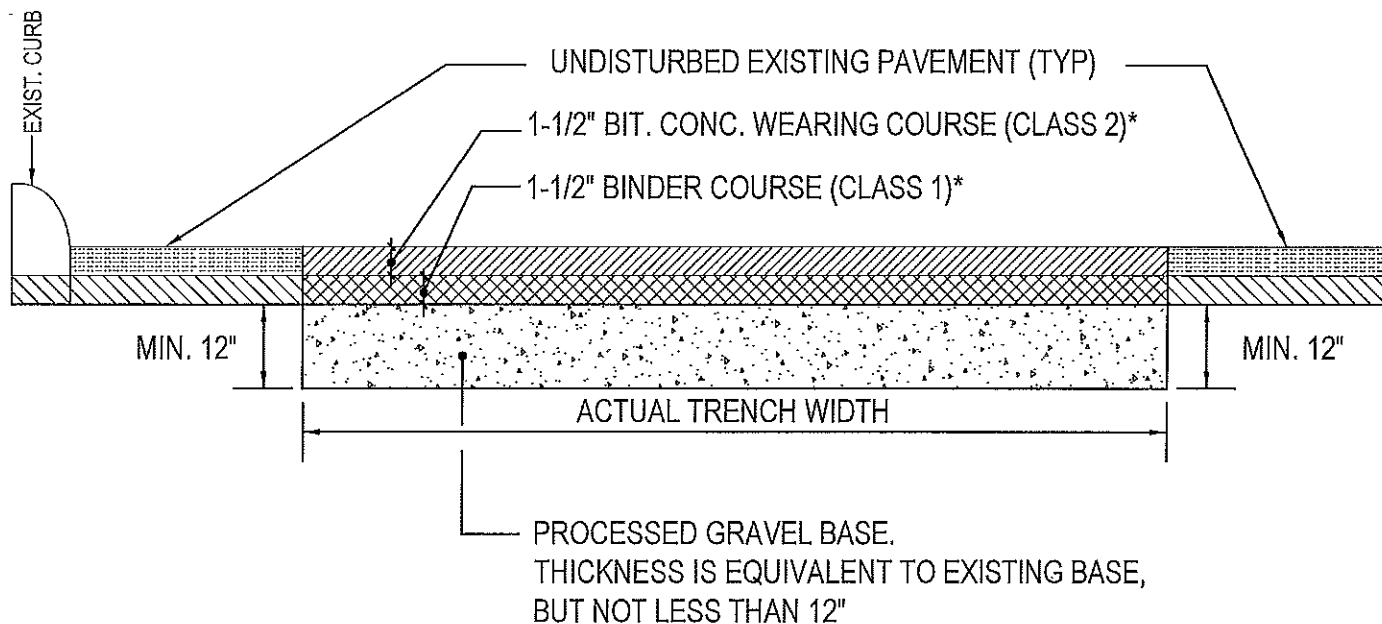
CITY OF DANBURY  
PUBLIC  
WORKS  
DEPARTMENT

## TYPICAL ROADWAY SECTION

DETAIL

DATE: 4/4/2013

DRAWN BY: P.J.T.



(NOT TO SCALE)

**NOTE:**

**\*INDUSTRIAL ZONES** - 4" TOTAL BITUMINOUS CONCRETE.

BITUMINOUS CONCRETE TO MEET REQUIREMENTS OF STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FORM 816, SECTION 4.06 AND M.04

REVISIONS	
DATE	COMMENTS
1/8/2014	

CITY OF DANBURY  
PUBLIC  
WORKS  
DEPARTMENT

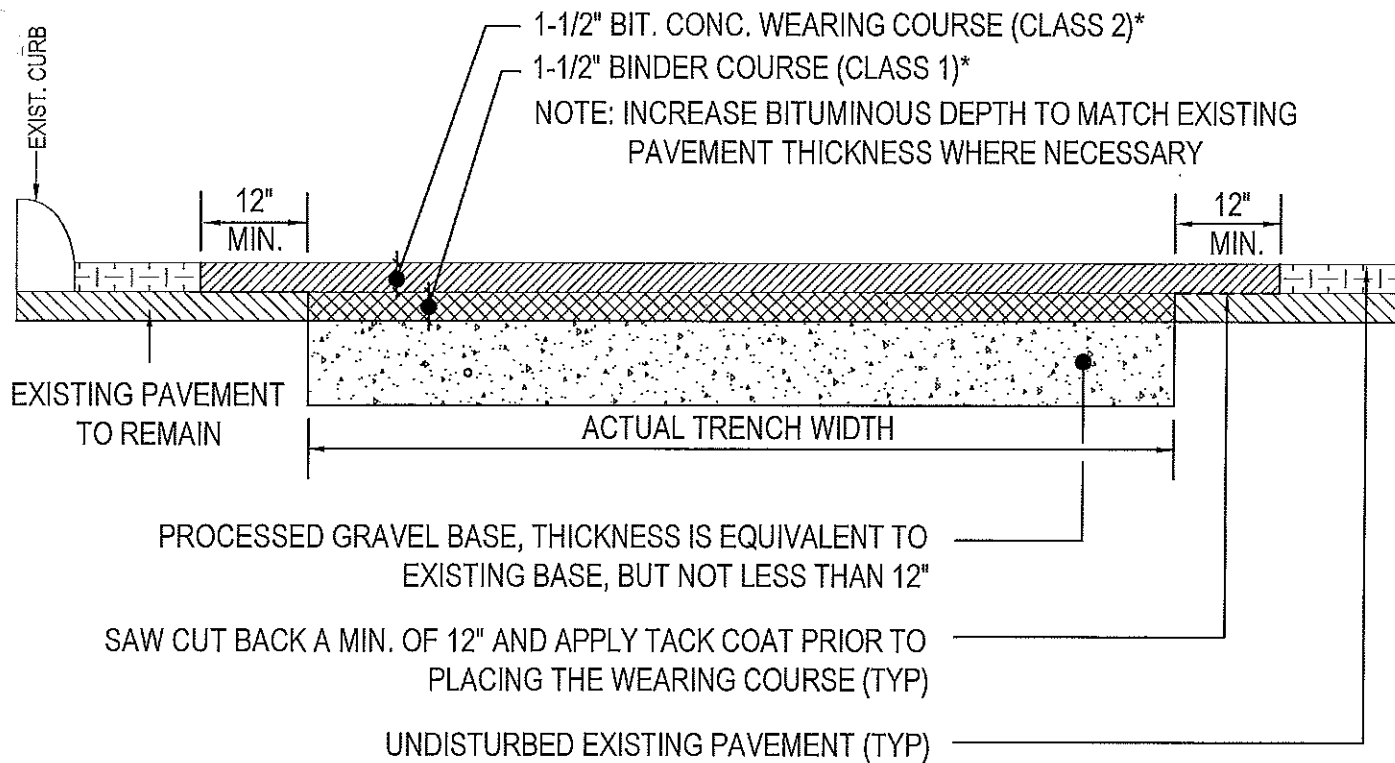
TEMPORARY  
PAVEMENT REPAIR DETAILS

DATE: 11/5/2013

DRAWN BY: P.J.T.

# PERMANENT PAVEMENT TRENCH REPAIR

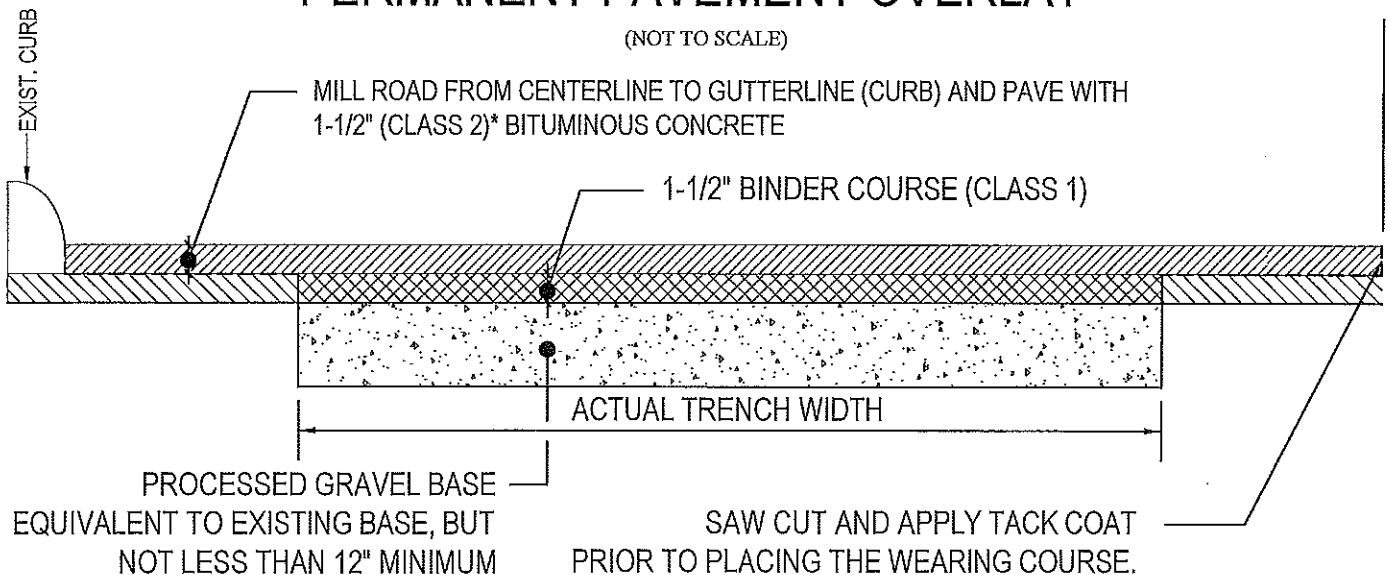
(NOT TO SCALE)



# PERMANENT PAVEMENT OVERLAY

(NOT TO SCALE)

\*\*CL

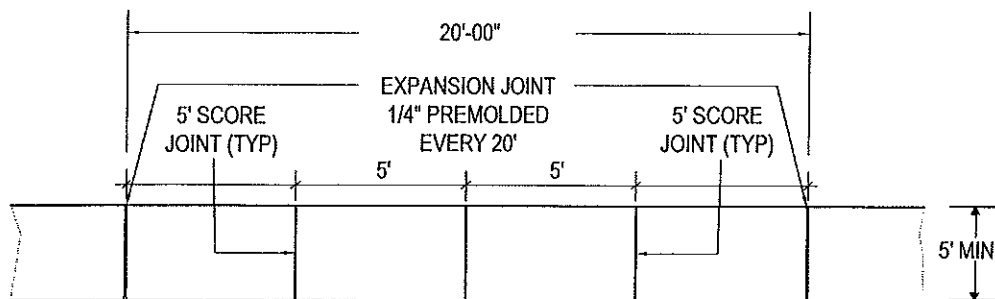


\*BITUMINOUS CONCRETE TO MEET REQUIREMENTS OF STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FORM 816, SECTION 4.06 AND M.04

\*\* OR MILL AND PAVE ENTIRE WIDTH OF ROAD, CURB TO CURB AS DETERMINED BY CITY.

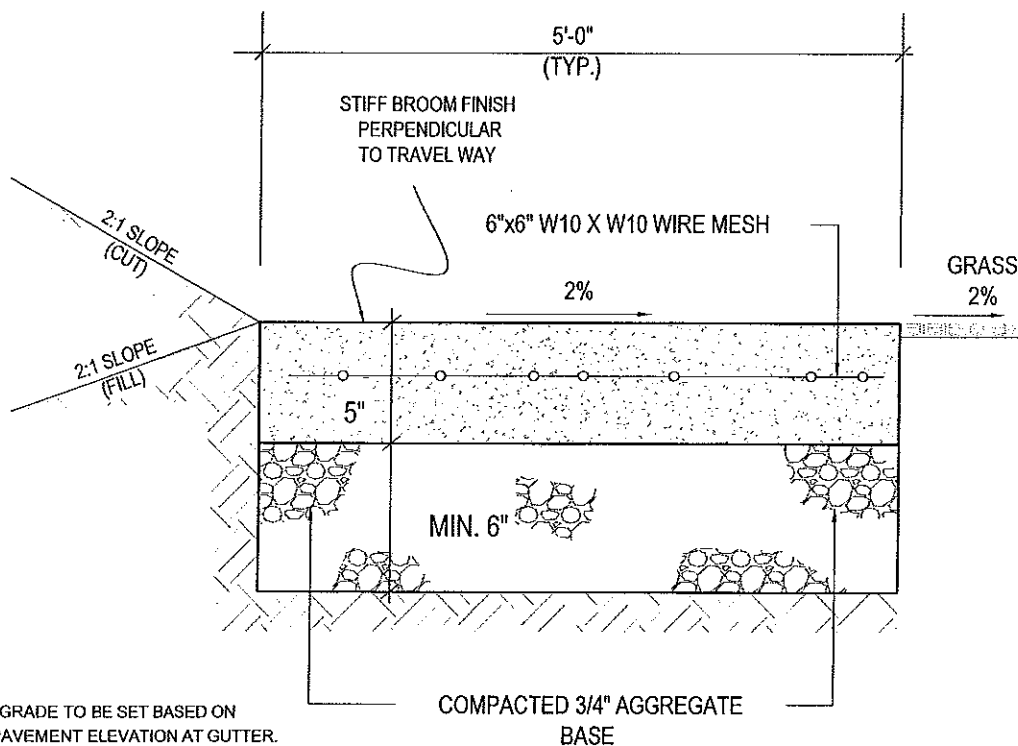
NOTE: IN INDUSTRIAL ZONES A TOTAL OF 4" OF BITUMINOUS CONCRETE IS REQUIRED.

REVISIONS		CITY OF DANBURY PUBLIC WORKS DEPARTMENT	PERMANENT PAVEMENT REPAIR DETAILS	
DATE	COMMENTS			
5/5/2006				
10/25/2013				
1/8/2014				
			DATE: 10/25/2013	DRAWN BY: P.J.T.



## PLAN

(NOT TO SCALE)



\* NOTE:  
SIDEWALK GRADE TO BE SET BASED ON  
FINISHED PAVEMENT ELEVATION AT GUTTER.

## SIDEWALK CROSS SECTION

(NOT TO SCALE)

### NOTE:

1. SEE ATTACHED CONCRETE MIX DESIGN AND SEALER SPECIFICATIONS.
2. ALL SIDEWALKS MIN. 5" IN DEPTH WITH THE EXCEPTION WHERE TRAFFIC CROSSES TO BE 6" IN DEPTH.
3. SIDEWALK GRADE TO BE SET BASED ON FINISHED PAVEMENT ELEVATION AT GUTTER (EXPOSED CURB FRONT FACE 6" MAX.)
4. CONTRACTOR TO COMPLY WITH ALL A.D.A. REQUIREMENTS

### REVISIONS

No.	DATE	By

CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT

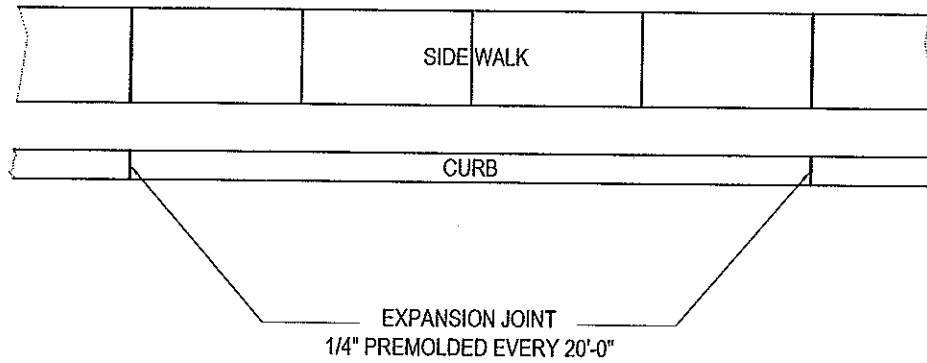
CONCRETE  
SIDEWALK

DETAIL

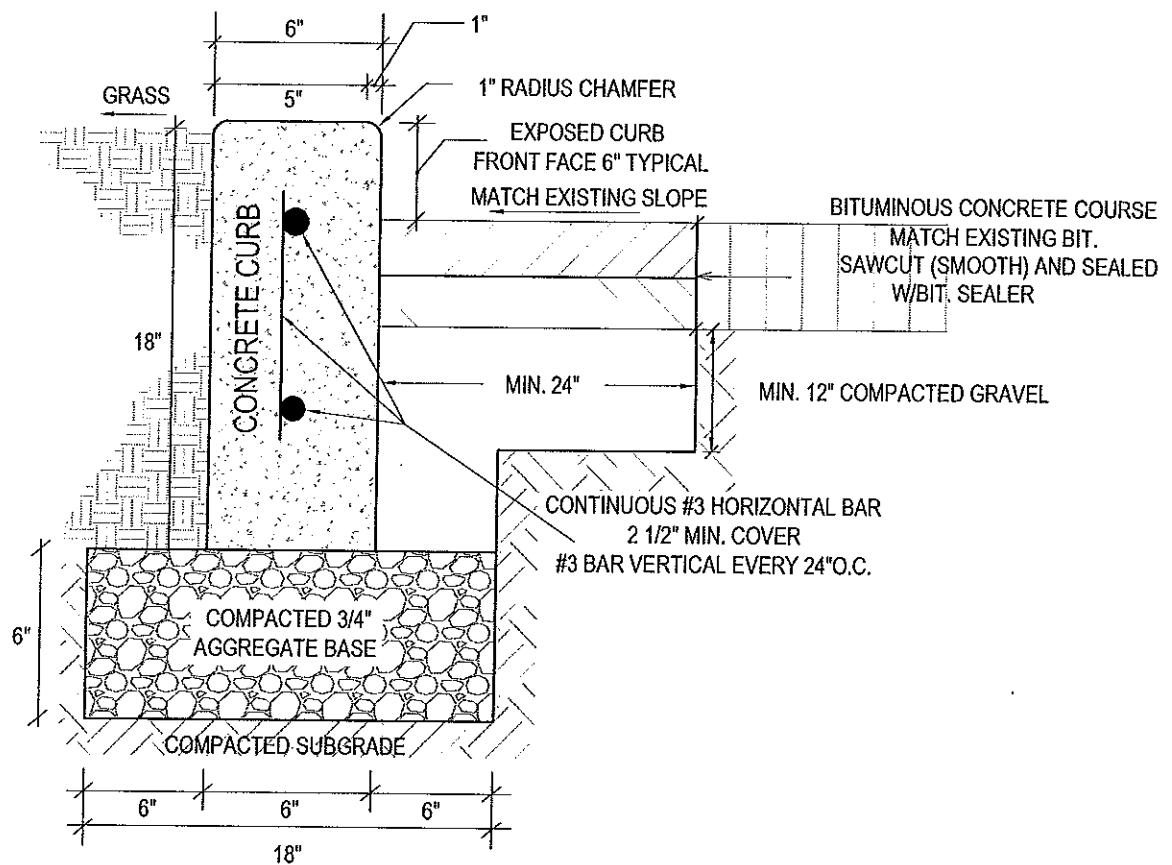
DATE: 2/29/2008

DRAWN BY: P.J.T.

1



## PLAN



## CURB

(NOT TO SCALE)

### NOTE:

1. SEE ATTACHED CONCRETE MIX DESIGN AND SEALER SPECIFICATIONS.

### REVISIONS

1.	DATE	BY
1	6/29/2005	P.J.T.
2	1/20/2006	P.J.T.
3	7/15/2010	P.J.T.

CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT

CONCRETE CURB

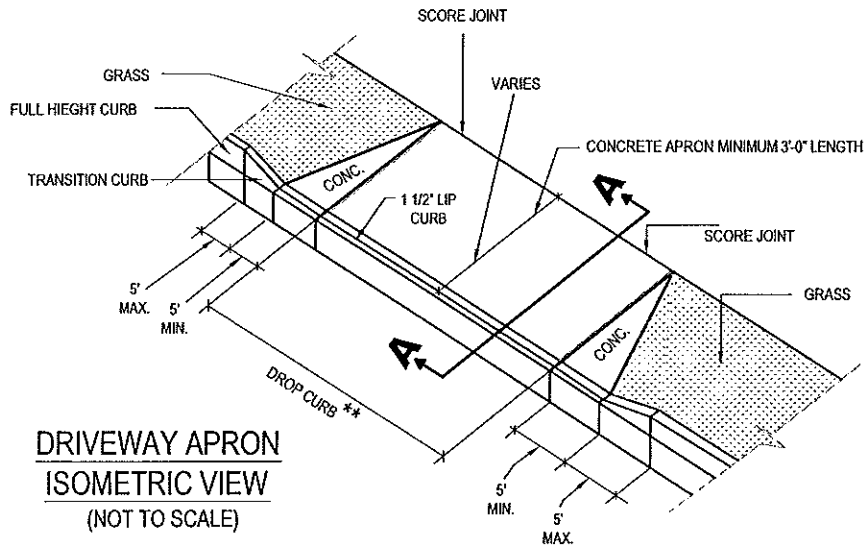
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DATE: 2/29/2008

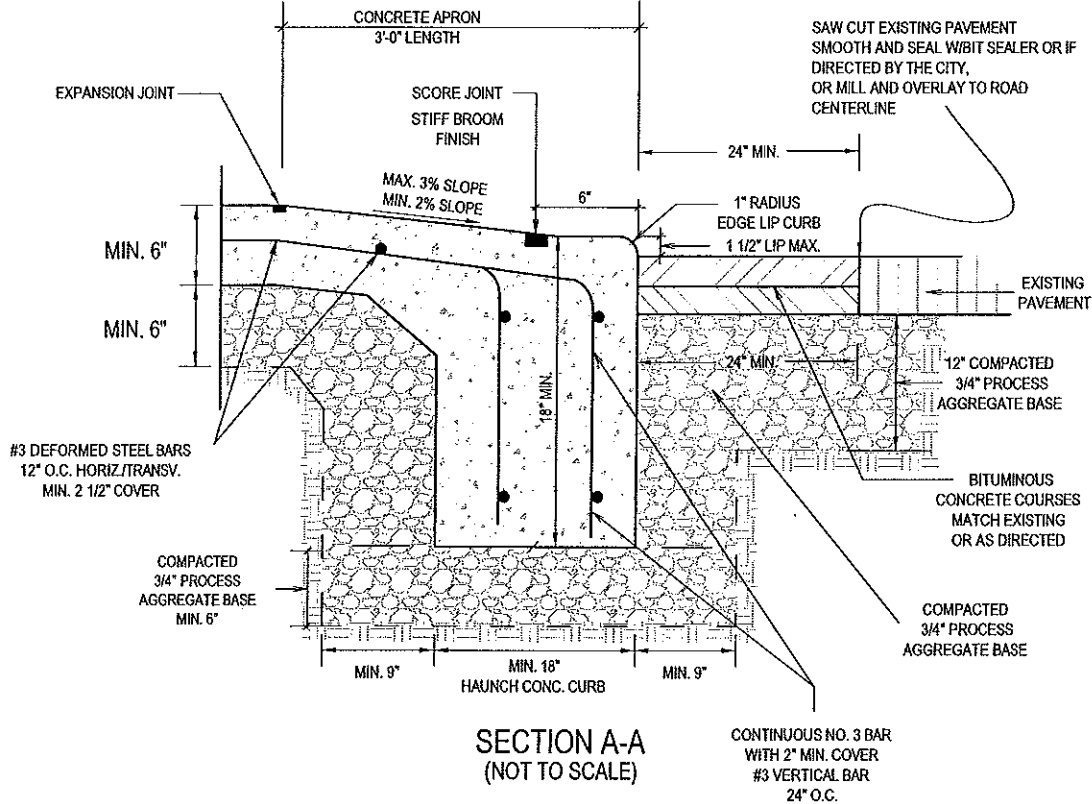
DRAWN BY: P.J.T.

2





- \*\*
1. NO MINIMUM WIDTH REQUIREMENT FOR DRIVEWAY SERVING A SINGLE FAMILY DWELLING EXCEPT IN SUBDIVISIONS WHERE SINGLE DRIVEWAYS SHALL BE 12 FEET WIDE. IF A JOINT DRIVEWAY IS APPROVED BY THE PLANNING COMMISSION, SAID JOINT DRIVEWAY IS TO BE 16 FEET WIDE.
  2. MINIMUM 9 FOOT WIDTH FOR DRIVEWAYS SERVING 2 OR 3 FAMILY DWELLINGS (A 12 FOOT WIDE DRIVEWAY IS RECOMMENDED).
  3. MINIMUM 12 FOOT WIDTH FOR ALL OTHER ONE WAY TRAVEL DRIVEWAYS AND MINIMUM 20 FOOT WIDTH FOR ALL OTHER TWO WAY TRAVEL DRIVEWAYS.



**NOTE:**

1. SEE ATTACHED CONCRETE MIX DESIGN AND SEALER SPECIFICATIONS.
2. USE OF INTEGRAL CONCRETE CURB/APRON MUST BE APPROVED BY THE CITY OF DANBURY.
3. CONTRACTOR TO COMPLY WITH ALL A.D.A. REQUIREMENTS
4. COMMERCIAL APRONS TO BE 8" IN DEPTH.

**REVISIONS**

No.	DATE	By

**CITY OF DANBURY  
ENGINEERING  
DEPARTMENT**

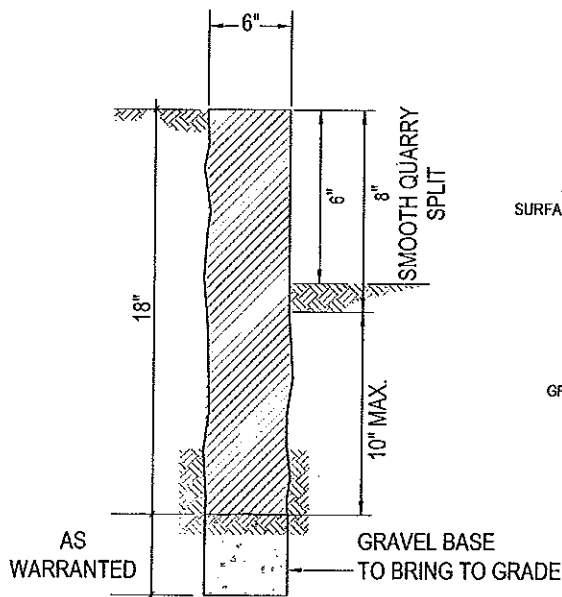
**CONCRETE APRON DETAIL  
WITH INTEGRAL CURB**

**DETAIL**

DATE: 2/29/2008

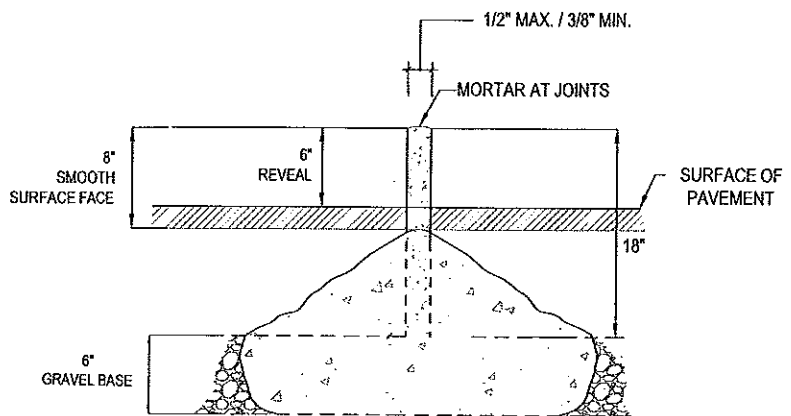
DRAWN BY: P.J.T.

**4**



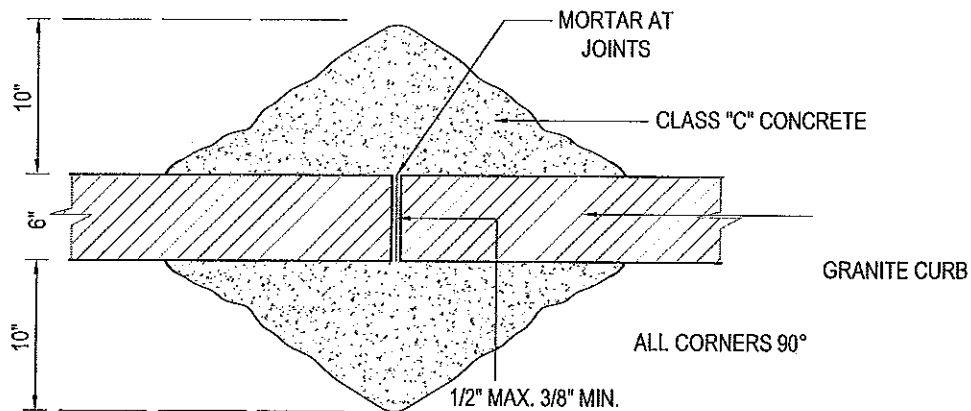
## GRANITE CURB

(NOT TO SCALE)



## GRANITE OR STONE PRECAST CURBING

(NOT TO SCALE)



EXPANSION JOINTS EVERY 50 FT.

## GRANITE OR STONE CURB

(NOT TO SCALE)

### NOTE

1. EXPANSION JOINTS EVERY 50 FEET.
  2. ALL JOINTS TO BE BACKED UP WITH CLASS "C" CONCRETE.
  3. GRANITE CURBING SHALL CONSIST OF APPROVED GRANITE, FURNISHED IN ACCORDANCE WITH THE DIMENSIONS AND DETAILS OF THE PLANS, OR AS DIRECTED.
- GRANITE CURBING SHALL BE PLACE IN ACCORDANCE TO THE PROVISIONS OF SECTION 8.13 OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 814A WHERE APPLICABLE.
- MATERIALS FOR THIS WORK SHALL CONFORM TO REQUIREMENTS OF ARTICLES M.12.06 FOR GRANITE CURBING, M.11.04 FOR MORTAR, IF REQUIRED AND M.02.03 FOR GRAVEL BASE.

### REVISIONS

No.	DATE	By
1		

CITY OF DANBURY  
ENGINEERING  
DEPARTMENT

GRANITE OR STONE  
CURBING

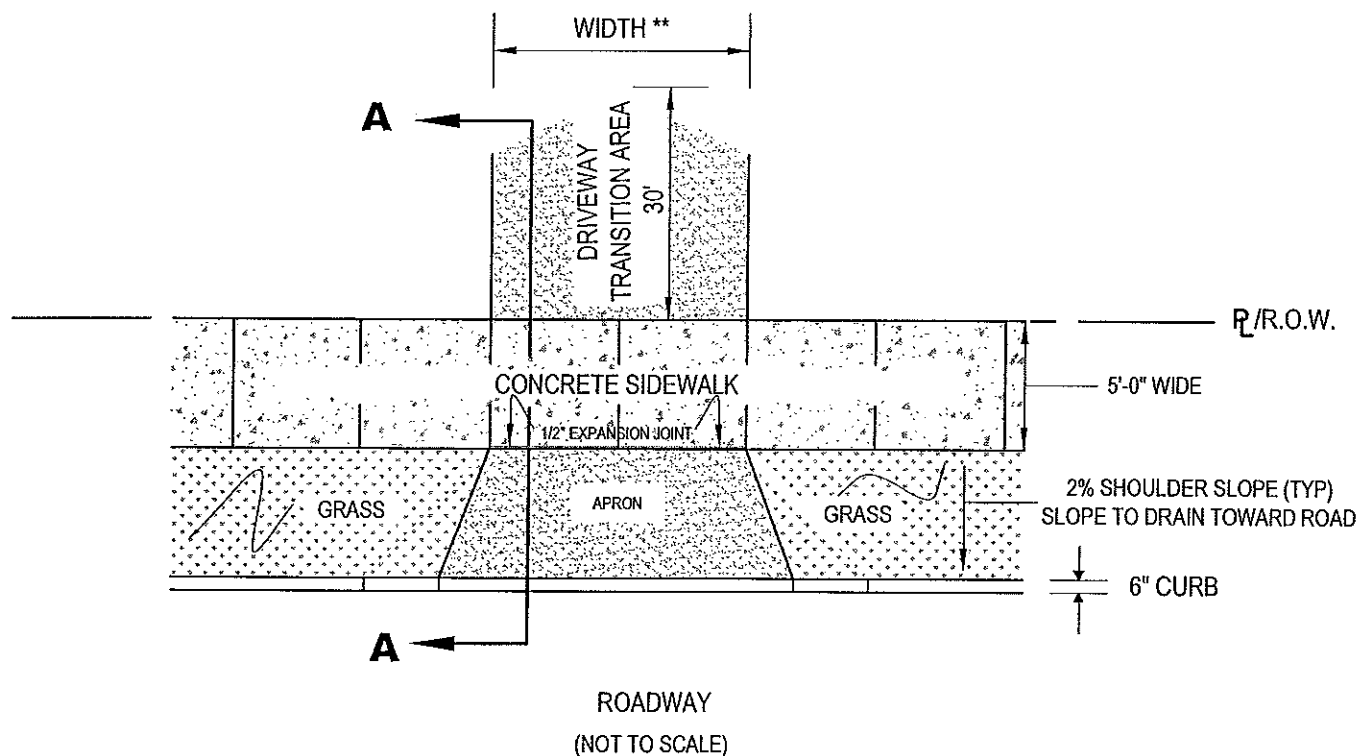
DETAIL

DATE: 2/29/2008

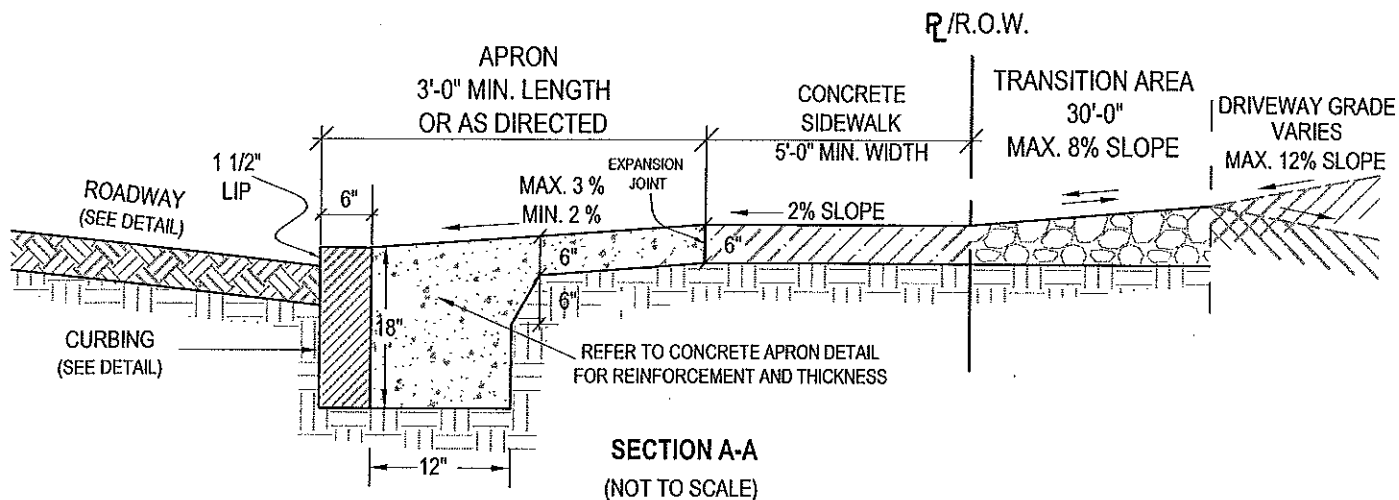
DRAWN BY: P.J.T.

5





- \*\*
1. NO MINIMUM WIDTH REQUIREMENT FOR DRIVEWAY SERVING A SINGLE FAMILY DWELLING EXCEPT IN SUBDIVISIONS WHERE SINGLE DRIVEWAYS SHALL BE 12 FEET WIDE. IF A JOINT DRIVEWAY IS APPROVED BY THE PLANNING COMMISSION, SAID JOINT DRIVEWAY IS TO BE 16 FEET WIDE.
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  3. MINIMUM 12 FOOT WIDTH FOR ALL OTHER ONE WAY TRAVEL DRIVEWAYS AND MINIMUM 20 FOOT WIDTH FOR ALL OTHER TWO WAY TRAVEL DRIVEWAYS.



NOTE:

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2. ALL SIDEWALKS MIN. 5" IN DEPTH WITH THE EXCEPTION WHERE TRAFFIC CROSSES TO BE 6" IN DEPTH.
3. USE OF INTEGRAL CONCRETE CURB/SIDEWALK MUST BE APPROVED BY THE CITY OF DANBURY.
4. SIDEWALK GRADE TO BE SET BASED ON FINISHED PAVEMENT ELEVATION AT GUTTER (EXPOSED CURB FRONT FACE 6" MAX.)
5. CONTRACTOR TO COMPLY WITH ALL A.D.A. REQUIREMENTS
6. REINFORCEMENT NOT REQUIRED IN BITUMINOUS DRIVEWAY APRONS.

REVISIONS		
lo.	DATE	By

CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT

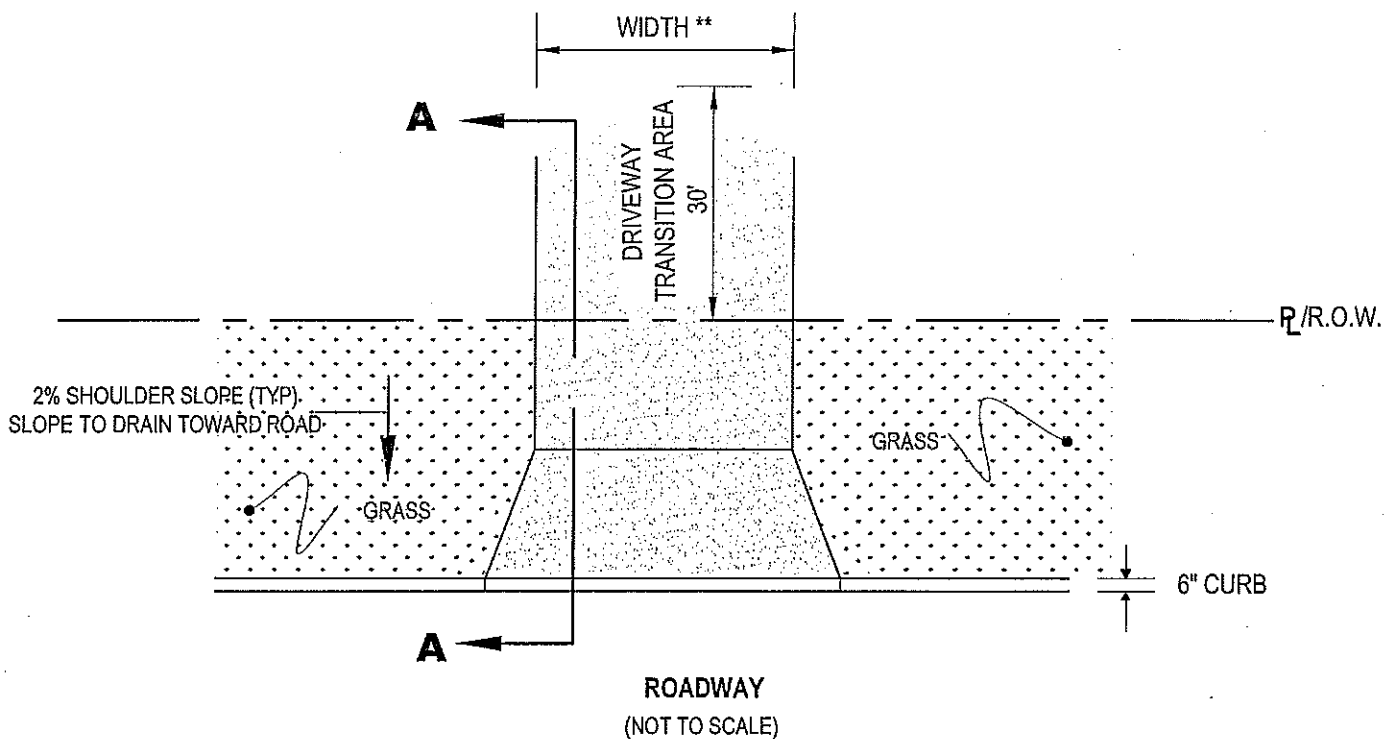
DRIVEWAY DETAIL WITH  
SIDEWALK

DETAIL

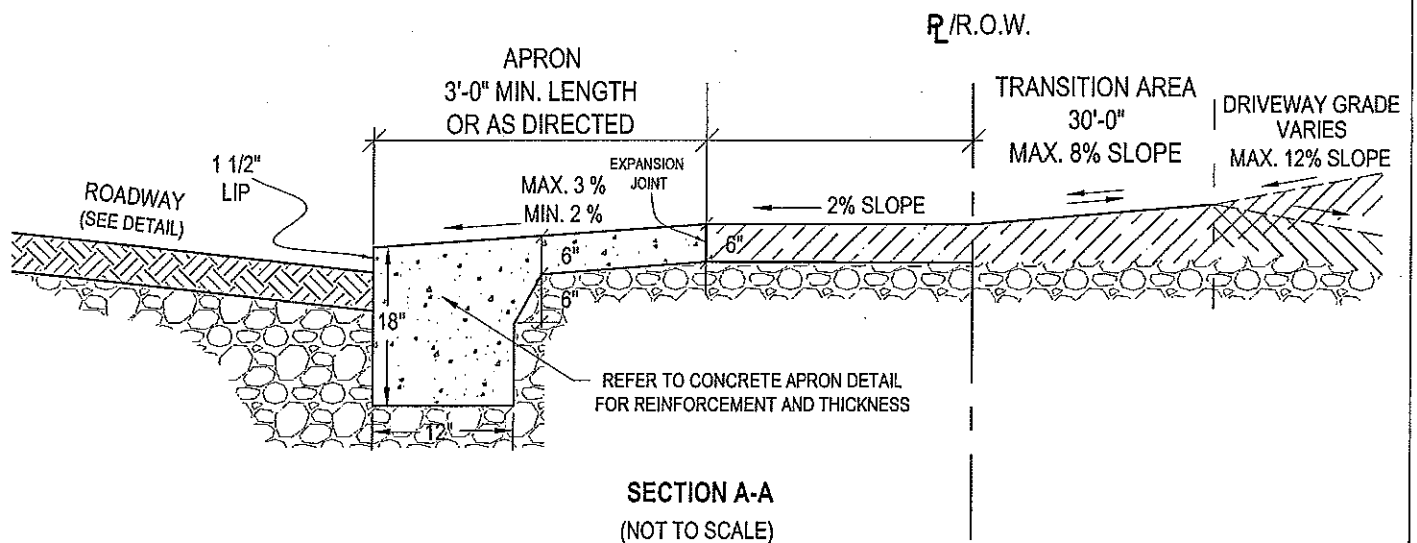
DATE: 2/29/2008

DRAWN BY: P.J.T.





- \*\*
1. NO MINIMUM WIDTH REQUIREMENT FOR DRIVEWAY SERVING A SINGLE FAMILY DWELLING EXCEPT IN SUBDIVISIONS WHERE SINGLE DRIVEWAYS SHALL BE 12 FEET WIDE. IF A JOINT DRIVEWAY IS APPROVED BY THE PLANNING COMMISSION, SAID JOINT DRIVEWAY IS TO BE 16 FEET WIDE.
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5. CONTRACTOR TO COMPLY WITH ALL A.D.A. REQUIREMENTS
6. REINFORCEMENT NOT REQUIRED IN BITUMINOUS DRIVEWAY APRONS.

REVISIONS

No.	DATE	By
1	1/25/11	P.J.T.

CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT

DRIVEWAY DETAIL WITHOUT  
SIDEWALK

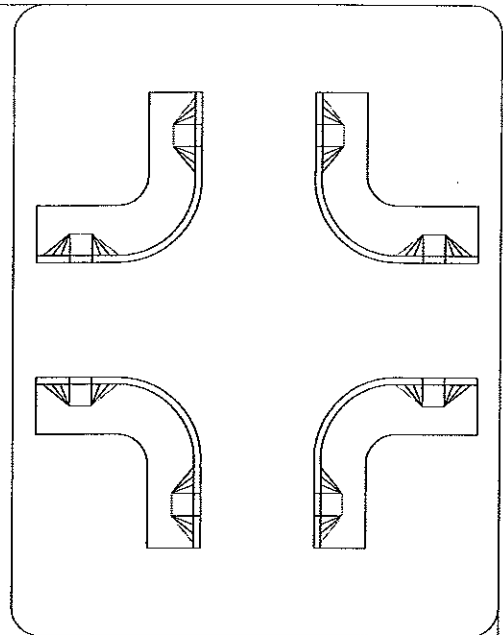
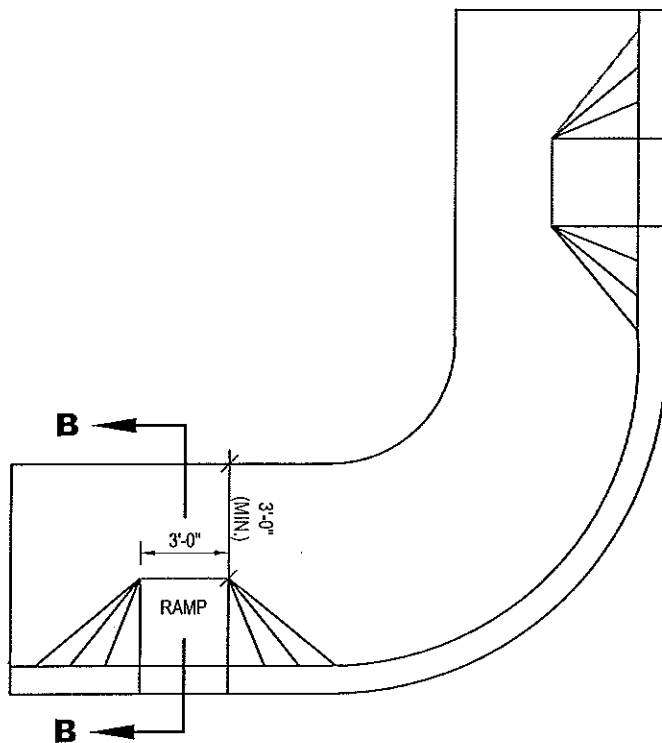
DETAIL

DATE: 2/29/2008

DRAWN BY: P.J.T.

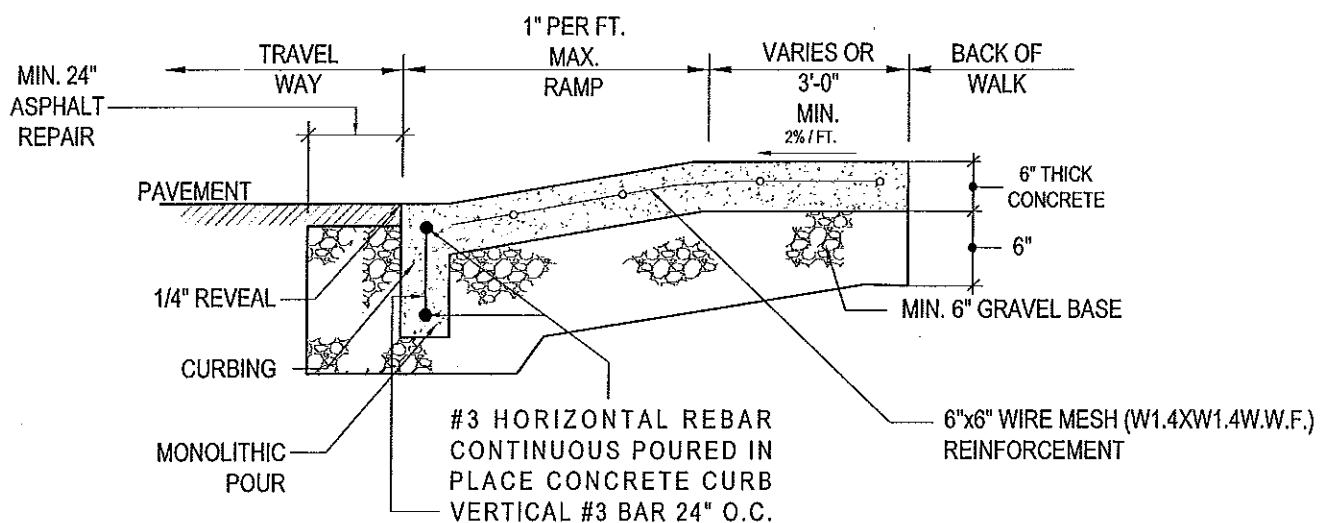
8





INTERSECTION DETAIL

PLAN  
SIDEWALK RAMP  
N.T.S.



NOTE:

1. MODIFIED CLASS "C" 4,500 PSI 28 DAY CONFORM TO CITY SPECIFICATIONS.
2. CONTRACTOR TO COMPLY WITH ALL A.D.A. REQUIREMENTS.
3. DEPRESSED CURBING MODIFIED D.O.T. CLASS "C" (A.E.) CONCRETE 4,500 P.S.I. @ 28 DAYS CONFORM TO CITY CONCRETE SPECIFICATIONS.

SECTION "B-B"  
(NOT TO SCALE)

REVISIONS

	DATE	By
1	6/29/2005	P.J.T.
2	1/20/2006	P.J.T.
3	7/15/2010	P.J.T.

CITY OF DANBURY  
PUBLIC  
WORKS  
DEPARTMENT

CONCRETE CURB  
AND  
RAMP FOR THE HANDICAPPED  
PLAN 2

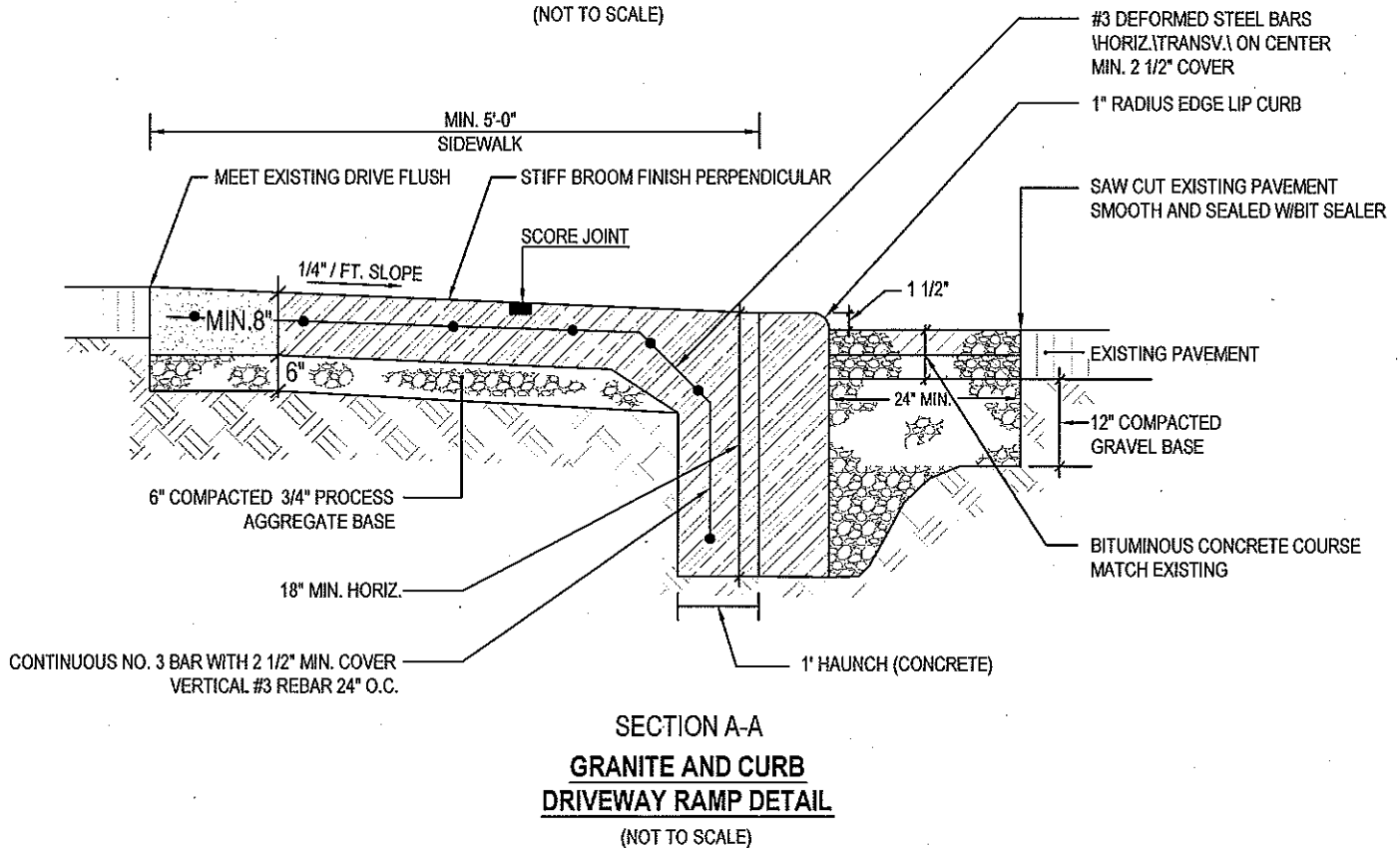
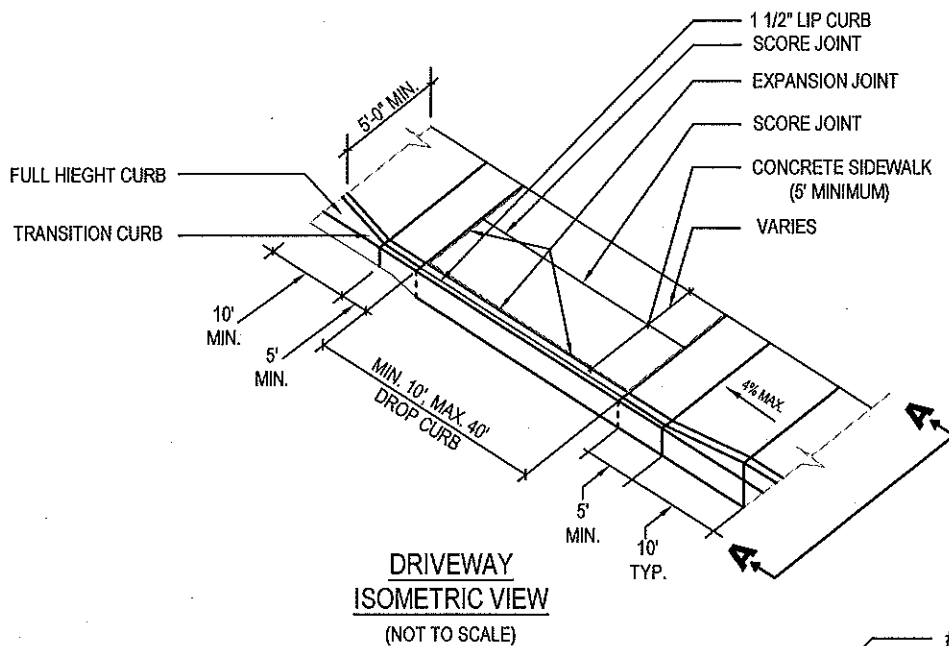
DETAIL

2 OF 2

DATE: 2/29/2008

DRAWN BY: P.J.T.

10



**NOTES:**

1. MODIFIED CLASS "C" CONCRETE 4,500 PSI MIX PER CITY SPECIFICATIONS.
2. 1 FOOT WIDE CONCRETE HAUNCH TO BE PROVIDED BEHIND CURB.
3. COMMERCIAL APRONS TO BE 8" IN DEPTH 4,500 PSI CONCRETE MODIFIED CLASS "C" PER CITY SPECIFICATIONS.

REVISIONS		
No.	DATE	By
	11/2010	P.J.T.
2	12/2010	P.J.T.

**CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT**

**COMMERCIAL  
DRIVEWAY DETAIL WITH  
SIDEWALK**

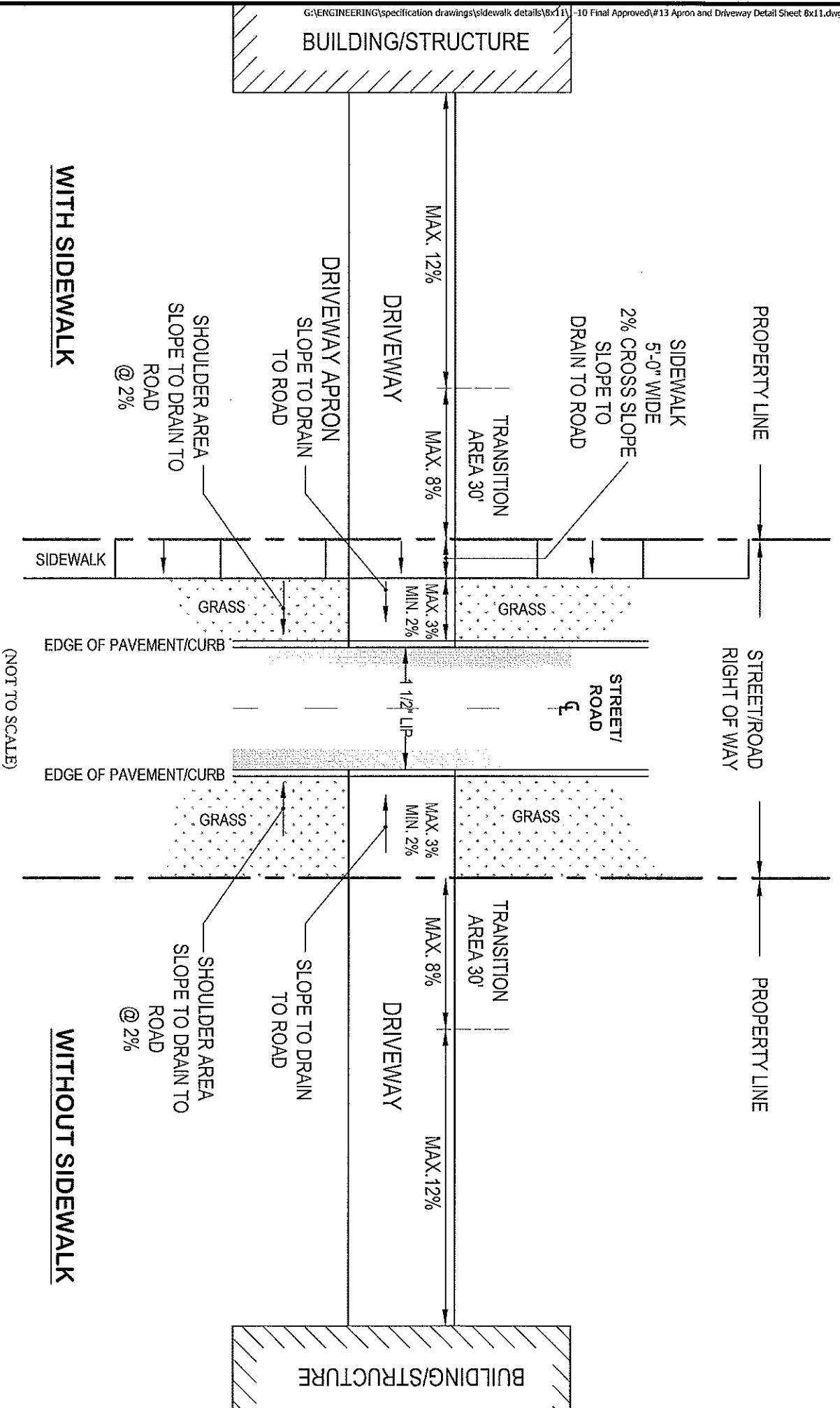
**DETAIL**

**DATE:**

**DRAWN BY: P.J.T.**

**11**





REVISIONS		
No.	DATE	COMMENTS

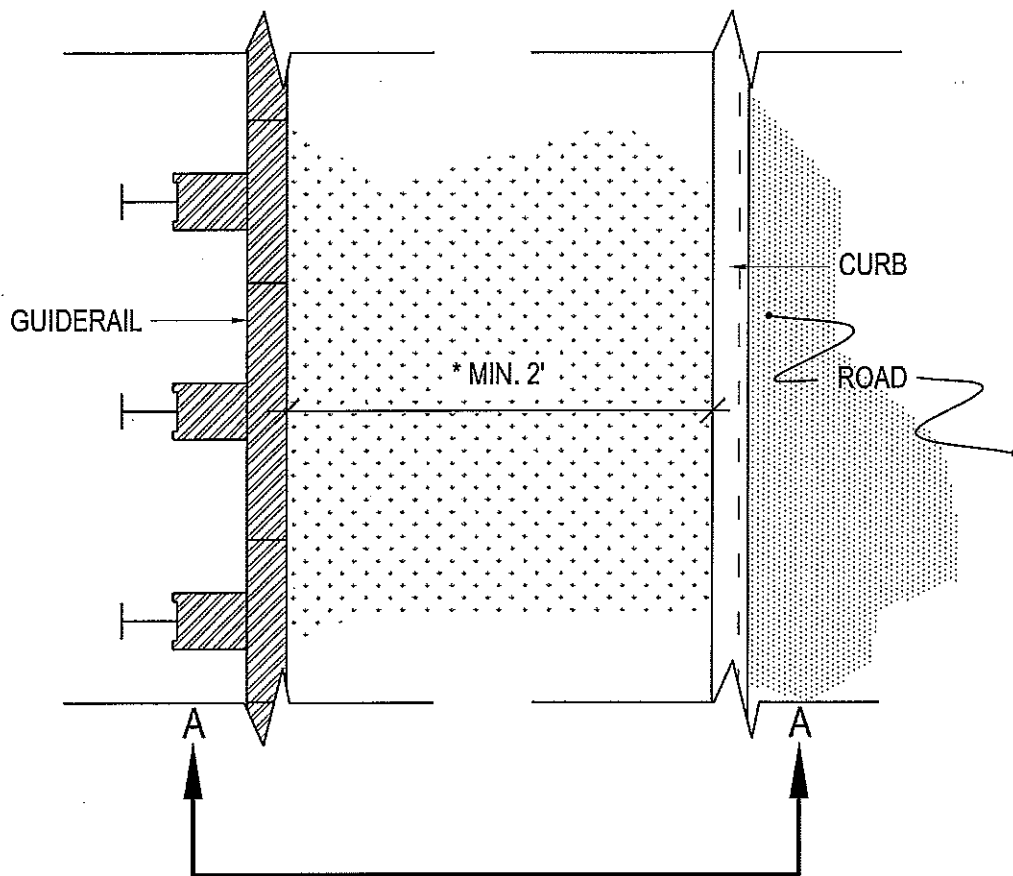
CITY OF DANBURY  
PUBLIC WORKS  
DEPARTMENT

DATE: 11/07

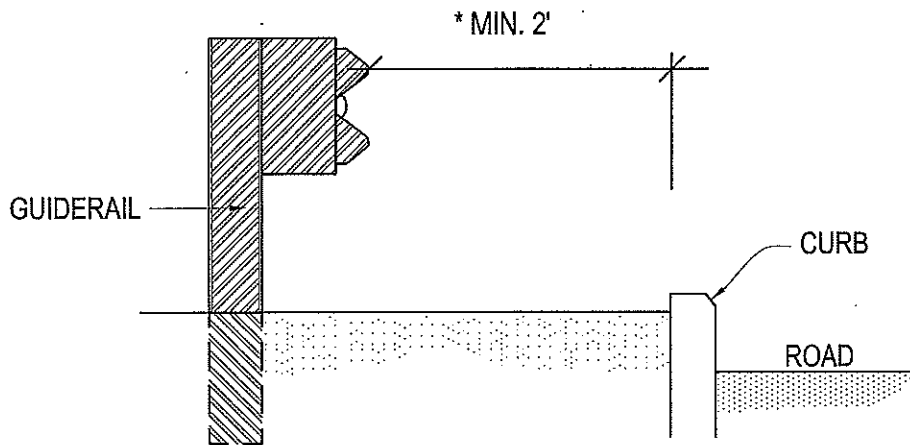
APRON AND DRIVEWAY DETAIL  
WITH AND WITHOUT SIDEWALKS

DRAWN BY: P.J.T.





PLAN  
(NOT TO SCALE)



SECTION A  
(NOT TO SCALE)

\* NOTE: MINIMUM 2 FEET IS TO BE PROVIDED BETWEEN FACE OF CURB AND FACE OF GUIDERAIL.

REVISIONS

No.	DATE	COMMENTS
1	10/31/2013	

CITY OF DANBURY  
PUBLIC  
WORKS  
DEPARTMENT

GUIDERAIL LOCATION  
DETAIL

DATE: 10/25/2013

DRAWN BY: P.J.T.

## **APPENDIX G**

### **INDEX STORM SEWER SPECIFICATIONS AND DETAILS**

#### **SPECIFICATIONS**

Storm Sewer - Pipe  
Design Frequencies

#### **DETAILS**

Storm Sewer Manhole Frame and Cover  
Cleanout – Monument Box Frame & Bolted Cover

**CITY OF DANBURY  
PUBLIC WORKS DEPARTMENT**

**STANDARD SPECIFICATION  
STORM SEWER – PIPE**

January 18, 1989

March 7, 1996

Reinforced Concrete Pipe – RCP

Reinforced Concrete Pipe shall conform to the latest ASTM Specification Designation C-76, for Class IV, which specifications are hereby made a part of these specifications. Mortar joints shall be used, with care being taken to fill the annular space completely and solidly with mortar. The interior joints shall be left perfectly smooth and the pipe shall be carefully freed from mortar and dirt of every description.

All pipe bedding and backfilling shall be in accordance with the recommendations of the American Concrete Pipe Association, and as ordered by the Engineer.

Asphalt Coated Corrugated Metal Pipe – ACCMP

Asphalt coated corrugated metal pipe (ACCMP) shall conform to the latest State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Section M.08.01. Pipe installation shall conform to the manufacturer's recommendations.

Aluminized Steel Corrugated Metal Type 2 Pipe

Aluminized steel corrugated metal Type 2 pipe shall conform to the latest AASHTO Specification M274-791 for coating and to the latest AASHTO Specification M36 for pipe. Pipe installation shall conform to the manufacturer's recommendations.

ADS-N12 Smooth Wall Polyethylene Corrugated Drain Pipe

Advanced Drainage System, Inc., ADS-N12 smooth wall polyethylene corrugated pipe Type S or SP (smooth interior surface with or without perforations) shall conform to AASHTO M-294 or M-252 and the latest State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction Section M.08.01. Pipe is to be installed in accordance with the manufacturer's recommendations. Pipe with corrugated interior surface is NOT approved. Elbows, tees and wyes are NOT permitted. All runs are to be straight. Where perforated pipe is used, stone is to be installed to a level at least 6 inches above the top of pipe. Where required for underdrain, stone is to be installed to the top of the trench in accordance with Article 7.51 of the above noted Conn DOT specifications or as directed by the City.

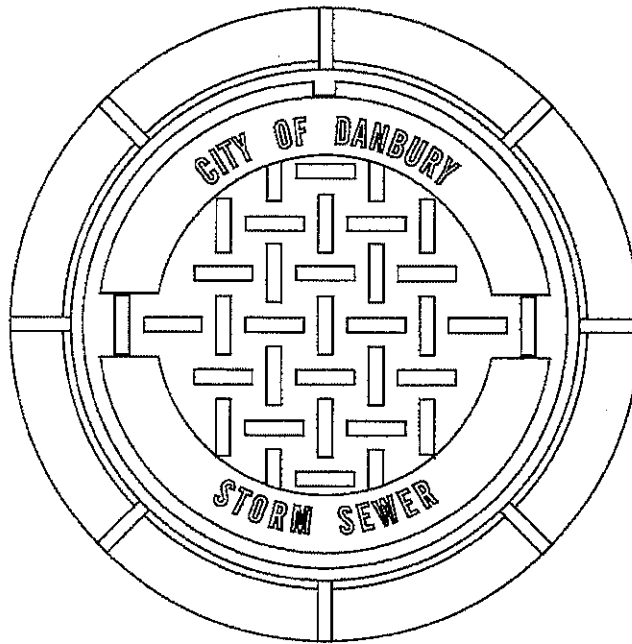
## STANDARD SPECIFICATION DESIGN FREQUENCIES FOR HYDRAULIC FACILITIES

- Watercourse/open channels 50 year storm frequency and 100 year storm frequency
- Bridge Culverts
  - Watershed area < 1 square mile 50 year storm frequency
  - Watershed area > 1 square mile 100 year storm frequency and 500 year storm frequency
- Bridges
  - Watershed area < 1 square mile 100 year storm frequency
  - Watershed area > 1 square mile 100 year storm frequency and 500 year storm frequency

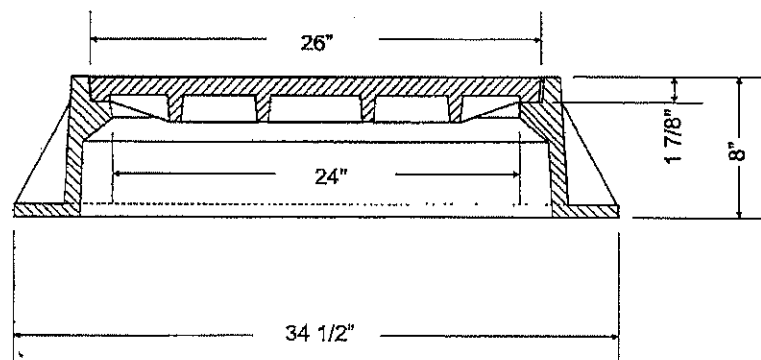
Design analyses are to be based on the above noted storm frequency criteria. Each design analysis will be reviewed for approval by the City of Danbury Engineering Division. The Engineering Division will determine the feasibility of construction of the hydraulic facility(ies) based on the results of the particular design analysis.

# Heavy Duty Manhole Frame & Cover

1047



PLAN



TYP SECTION

## NOTES:

1. Material - Gray Cast Iron ASMA 48-83, Class 30B, AASHTO HS20-44 Highway Loading;
2. Bearing surface at seat of frame and cover shall be machined for uniformity;
3. Cover shall have STD penetrating pickholes;
4. Castings supplied without surface coating.



**CAMPBELL FOUNDRY COMPANY**

Harrison, N.J. 07029

Phone: 973-483-5480

FAX: 973-483-1843

SCALE:

APPROVED BY:

DRAWN BY:

DATE: 05/04/06

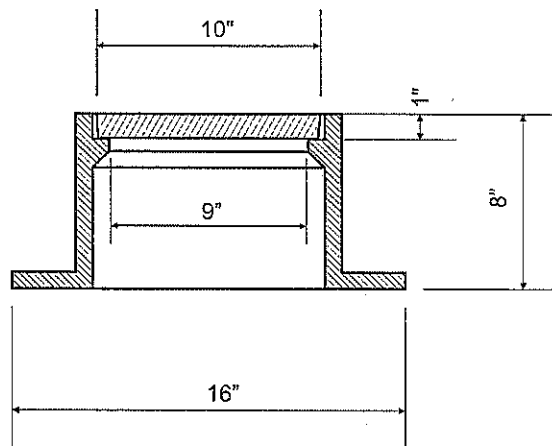
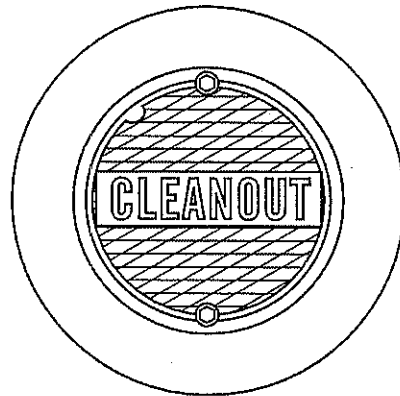
REV:

Heavy Duty Manhole Frame & Cover

Pattern Number: 1047

# Monument Box Frame & Bolted Cover

4155-N



## NOTES:

1. MATERIAL: Gray Cast Iron ASTM A48-83, Class 35B,  
AASHTO HS20-44 Highway Loading,
2. Cover shall be bolted to frame with two recessed, 1/2"-13  
SS hex head cap screws;
3. Supplied without surface coating;
4. Made in USA.



**CAMPBELL FOUNDRY COMPANY**

Harrison, N.J. 07029

Phone: 973-483-5480 FAX: 973-483-1843

SCALE:

APPROVED BY:

DRAWN BY: D.L.

DATE: 06/03/10

REV.:

Monument Box Frame & Bolted Cover

Pattern Number: 4155-N

## **APPENDIX H**

### **MINIMUM WATER MAIN, SANITARY SEWER MAIN AND STORM DRAINAGE RECORD DRAWING REQUIREMENTS**

## **Minimum City Water Main, Sanitary Sewer Main and Storm Drainage Record Drawing Requirements**

In an effort to help expedite the review and acceptance of record/as-built plans and profiles, the City of Danbury herein more clearly documents its requirements for water main, sanitary sewer main and storm drainage record/as-built drawings. The record/as-built drawings should attempt to mimic the presentation of the original approved design plans so that record/as-built drawings can be easily compared to the original design. The intents of these record/as-built drawings are to confirm that the construction of utilities agrees with the approved design and to show as much information as possible about the utilities to be taken over by the City. When sanitary sewer, water and storm drainage lines are newly constructed in the same right-of-way, they are all to be shown on the plan portions of the drawings, however, a complete set of mylar plans and profiles is to be provided for each utility.

### **Plan View:**

- Plans at a scale of 1" = 40' are preferable. Other scales are to be agreed to by the City Engineer.
- Stationing is to begin at the same point as shown on the approved design plans and is to be provided along the entire length of the utility extension shown.
- Plans and profiles are to be oriented in the same left to right direction on the drawing (for example: if Station 0+0 is located on the left side of the plan portion of the drawing, Station 0+0 is to also be located on the left side of the profile portion of the drawing).
- Sanitary Sewer manholes are to be numbered with rim elevations and stationing provided. Water main valves, fire hydrants, and fittings are also to be labeled as to their relative station locations.
- Right-of-way, easement and property lines are to be provided as warranted by the location of the utility.
- The existing and /or proposed buildings served by new utility main are to be shown with their corresponding street addresses.
- Locations of existing and new utility mains (gas, electric, water, sanitary sewer and storm drain) are to be shown in order that the adequacies of horizontal clearances can be verified.
- Locations of all new water and/or sanitary sewer services within the City right of way, including water curb stops and sewer cleanouts, are to be shown. The depth of cover over the end of each dead ended lateral is to be noted. Survey ties shall be noted from corners of the building foundation or other fixed permanent points within 100' of any buried dead ended lateral or curb stop, where possible.



- “Invert in” and “invert out” elevations are to be provided for all sanitary sewer manholes on both the plan and the profile.
- Pipe installed is to be labeled as to size, type and class.
- Valves, bends and tees are to be labeled as to type, station and bend direction (horiz. or vert.). (i.e. 8” x 6” MJ tee, horiz., STA. 11+16.1)
- Ties from fixed points to all water valves are to be provided.
- The limits and type of restraint (i.e. MJ pipe with Megalugs, thrust blocks, restrained joint pipe) are to be **boldly** shown along water mains.
- Curbing, edge of paved road, driveway aprons, nearby walls and other important structures and features are to be shown with contours within 25 feet on either side of the utility.
- Existing and proposed utility easements are to be shown.
- A north arrow, symbol legend, scale of drawing, project name, date drawing was prepared, drawing revision dates, name of installation contractor, street names, etc. are to be indicated.
- Additional details and/or notes may be required to enlarge, clarify and properly label components that are not clearly readable at the scale of the drawing.

#### **Profile:**

- Profiles with horizontal scales of 1” = 40’ and vertical scales of 1” = 4’ are preferable.
- One foot elevation grid lines are to be shown with 10 foot elevation lines shown **boldly**.
- Sanitary sewer pipe slopes are to be labeled in percents to the nearest hundredths.
- Cover provided over piping is to be noted at intervals along the main, especially in areas of minimum cover or where cover is less than the City’s standard 4.5 feet.
- The finished grade over the pipe will be the elevation of the “finished pavement” or at least the pavement’s binder course.
- Approximate elevations of the top of rock encountered in the utility excavation are to be noted.
- Fire hydrants are to be labeled and shown vertically through finished grade.

- Water valves, bends and tees are to be indicated and labeled by type, station and bend direction (horiz. or vert.). (i.e. 8" x 6" MJ tee, horiz., STA. 11+16.1)
- The limits and type of restraint (i.e. MJ pipe with Megalugs, thrust blocks, restrained joint pipe) are to be **boldly** shown along water mains.
- All utility crossings over or under the new sanitary sewer line or water main are to be shown and noted in order for the adequacies of clearances provided to be verified.

**Additionally:**

- All as-built drawings are to be signed and sealed by a State of Connecticut licensed land surveyor.
- A set of final mylars is to be submitted to the City Engineering Division for its files.
- A separate utility easement map(s) is to be submitted for on-site constructed utilities. This map is to be suitable for filing in the Danbury Land Records.
- Electronic versions of the final record drawings and easements are to be provided on CD in AutoCad 2004 (.dwg, .dxf or .dwt) or version compatible with the latest AutoCad format.

## **APPENDIX I**

### **MINIMUM CITY ROADWAY & STORM DRAINAGE AS-BUILT DRAWING REQUIREMENTS**

## **Minimum City Roadway & Storm Drainage As-Built Drawing Requirements**

Dated 9/11/08  
Revised January, 2010

The Common Council will take no final action on any petition requesting the acceptance of a road until the road has been constructed to the satisfaction of the Public Works Department and corresponding satisfactory final as-built drawings have been provided to the Engineering Division. As-built drawings (plan and profiles) are to be submitted to the Engineering Division for review and approval. The intent of the as-built drawings will be to provide accurate plan(s) and profile(s) of the road and storm drainage to be turned over to the City, along with identifying other appurtenances within the future City right-of-way.

The Developer/Contractor shall submit to the Engineering Division (3) complete sets of paper record drawings for review. One copy will be forwarded to the City Highway Department for review and comment. As-built drawings shall be prepared by a Land Surveyor licensed in the State of Connecticut in conformance with "Minimum Standards for Surveys and Maps in the State of Connecticut", prepared and adopted by the Connecticut Association of Land Surveyors, September 26, 1996, as amended. At minimum, the following items are to be provided on the road as-built drawings:

### **Plan View:**

- a. As-built drawings are to be at a scale of 1" = 40' and/or match the design plan scale for easy comparison.
- b. A title block indicating "As-Built Drawing" is to be added. A north arrow, symbol legend, scale of drawing, road name, project name, date drawing was prepared, drawing revision dates, etc. are to be indicated.
- c. Stationing is to begin at the same point as shown on the approved design plans or at the beginning of an existing road and is to be provided along the entire length of the roadway.
- d. Plans and profiles are to be oriented in the same left to right direction on the drawing (for example: if Station 0+0 is located on the left side of the plan portion of the drawing, Station 0+0 is to also be located on the left side of the profile portion of the drawing).
- e. The as-built drawing is to show the relationship of the completed roadway and storm drainage to the proposed City right of way lines and any storm drainage easement limits. The right of way lines, along with any easements, are to be shown with bearings and distances.
- f. As-built location and types of sidewalks, curbs, sidewalk ramps, driveway openings, guide rail, traffic signs, pavement markings and protective fence are to be indicated. Dimensions of major features, such as width of roadway and sidewalk, curb radius, etc. are also to be noted.
- g. Locations of all drainage structures together with top of frame elevations, top of headwall elevations and invert elevations are to be shown. All portions of the storm drainage system that lie within the new City right-of-way and within easements that will be granted to the City (for example, structures, drain pipes, plunge pools and rip rap pads) are to be shown. As-built locations of all foundation drains that discharge into City drainage structures are to be shown. Catch basins are to be shown bold, numbered and the "invert in", "invert out" and bottom of sump elevations are to be noted on both the plan and the profile.

- h. Storm drain pipes installed are to be labeled as to size, material, slope and have an arrow indicating the direction of flow in the plan and profile.
- i. As-built locations of all street light poles, with owners and numbers noted, are to be provided.
- j. Street trees installed within the right of way are to be indicated and labeled.
- k. Any storm drainage installed as part of this project which will remain private is to be clearly noted on the as-built drawing as "private". Those parts not noted as "City" will remain private.
- l. As-built locations of all underground utilities (i.e. electric, gas, water, sanitary sewer, telephone, and cable) as well as all above ground utility transformer pads, manholes, junction boxes, vaults (with dimensions), handholes, etc. are to be shown in order that the adequacies of horizontal clearances can be verified relative to the storm drainage.
- m. All monumentation required and found for the project perimeter (street line, lot corners, angle points and easements) is to be indicated. The as-built drawing is to show the locations of all new and existing street monuments. New street monuments are to be provided to establish the beginning and end of curves on any new section of City right of way. Monuments are to be set on all right-of-way lines of street, at all intersections, angle points and points of curves. The developer's surveyor shall certify that the location of all monuments is accurate before acceptance of the street by the City of Danbury.
- n. The existing and /or proposed lots fronting the new city roadway are to be shown with their "N/F" owners and corresponding street addresses and lot numbers.
- o. Traffic signal structures and appurtenances, if applicable (for example, traffic light poles, signal boxes, street signs and traffic signal loops) are to be noted.
- p. The final grading of the right-of-way with two foot contours and spot elevations.
- q. The name of the road construction contractor shall be noted, along with the date of final paving.
- r. The as-built drawing is also to indicate in plan view the adequate sight distances at all intersections have been provided. The developer shall obtain all necessary related rights so that clear, unobstructed sight distance(s) are obtained.
- s. Additional details and/or notes may be required to enlarge, clarify and properly label components that are not clearly legible at the scale of the drawing.
- t. The typical notes will include the volume and page of all easements conveyed to the City of Danbury on the mylar after legal documents are filed. Pertinent town clerk map references are to be noted on the drawings.

Profile:

- a. Profiles with horizontal scales of 1" = 40' and vertical scales of 1" = 4' are preferable or the scales are to match the design plan scale for easy comparison.
- b. One-foot elevation grid lines are to be shown with 10-foot elevation lines shown boldly.

- c. Drainage pipe slopes are to be labeled in percents to the nearest hundredths.
- d. Cover provided over piping is to be noted at intervals along the storm drains, especially in areas of minimum cover or where cover is less than the City's standard 18-inches.
- e. The finished grade of the road is to be the elevation of the "finished pavement" or at least the pavement's final binder course. Final centerline road slopes along with vertical curve data shall be indicated on the profile of the road as-built drawing.
- f. Profile sheets are to show existing and finished roadway centerline profiles with final roadway centerline elevations noted at every 50 foot interval and at all low, high and intersection points. Profile sheets shall also include all underground utilities, including pipe sizes and materials, top of frame and invert elevations, flow lines and slopes of pipe, etc.
- g. Approximate elevations of the top of ledge/rock encountered in any excavation are to be noted.
- h. All utility crossings over or under the new storm drainage lines are to be shown and clearances noted in order for the adequacies of vertical clearances provided to be verified.

All as-built drawings are to be signed and sealed by a State of Connecticut licensed land surveyor or professional engineer. When the as-built drawing is found to be acceptable, a final signed and sealed mylar is to be filed in the Engineering Division, along with an electronic copy submitted on a compact disc. Mylars are to be stamped (embossed seal and wet signature) by the Land Surveyor responsible for the record drawing. Electronic versions of the final record drawings and easements are to be provided on CD in AutoCad 2004 (.dwg, .dxf or .dwt) or compatible with the latest AutoCad version format. A paper copy of the approved as-built drawing is to be sent to the Highway Department at 50 Newtown Road for their files

## **APPENDIX J**

### **PLAN REVIEWS FOR PROPOSED UTILITY LINE PROJECTS WITHIN CITY RIGHTS-OF-WAY**

## **PLAN REVIEWS FOR PROPOSED UTILITY LINE PROJECTS WITHIN CITY RIGHTS-OF-WAY**

### **REQUIREMENTS:**

Any utility company (gas, telephone, electric, cable, fiber optic, etc.) proposing to install, extend or upgrade their facilities within a City of Danbury right-of-way is required to submit plans to the City of Danbury Engineering Division for approval prior to construction or obtaining a road opening permit. Requests for any utility line installation, extension or upgrade within a City right of way shall be addressed to the City Engineer.

A pre-design meeting is required with the Engineering Division, prior to the submittal of plans.

In order for the request to be reviewed for accuracy and in a timely manner, all requests must include the following information:

1. A cover letter indicating the street name and a brief description of the proposed work. The letter should include the name, address and telephone number of the contact person who will address any review comments.
2. A vicinity map at a scale of 1"=1000'.
3. Two (2) sets of design/construction plans prepared by the utility company or their engineer for review and comment. The Engineering Department may be contacted at (203) 797-4641. Another set of plans is to be sent to the City Highway Department.
4. The plans shall be drawn to a scale not less than 1"= 40' and should show all existing features, including existing utilities, easements, street names and building addresses. The plans are to show the proposed work, including the type of construction (bore, open trench, etc.) and horizontal/vertical clearances to City owned utilities (storm, water and sanitary sewer). It is strongly recommended that the utility obtain the latest information with regard to existing utilities prior to submitting proposed plans. Minimum horizontal clearance to storm, water and sanitary sewer facilities is 5 feet. Minimum vertical clearance to storm facilities is 12-inches; and to water and sanitary sewer facilities is 18-inches. Pavement limits will be determined when a Road Opening Permit is issued by the City Permit Center.

The utility company is to contact the City Construction Services Division at (203) 796-8069 with any questions relative to the Road Opening (Right-of-Way). Application for said permit is to be made at the City Permit Center in City Hall.

It is the utility company's responsibility to coordinate with other impacted utilities (CL&P and other non-City utilities) with copies of correspondence with said utility company forwarded to the Engineering Division..

A pre-construction meeting is required prior to the start of construction, after the Call Before You Dig mark-out has been performed.

If the request is approved, the utility company will receive an approval letter from this office with comments/conditions, if any.

Prior to final paving but after the utility work is completed, the City Engineering Division is to be provided with two (2) copies of the gas main as-built drawing conforming to City as-built



requirements to be reviewed by the Engineering Division as to they relate to the City's water and sanitary sewer utilities' location.