SEWER CONSTRUCTION

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Urbana & Champaign Sanitary District

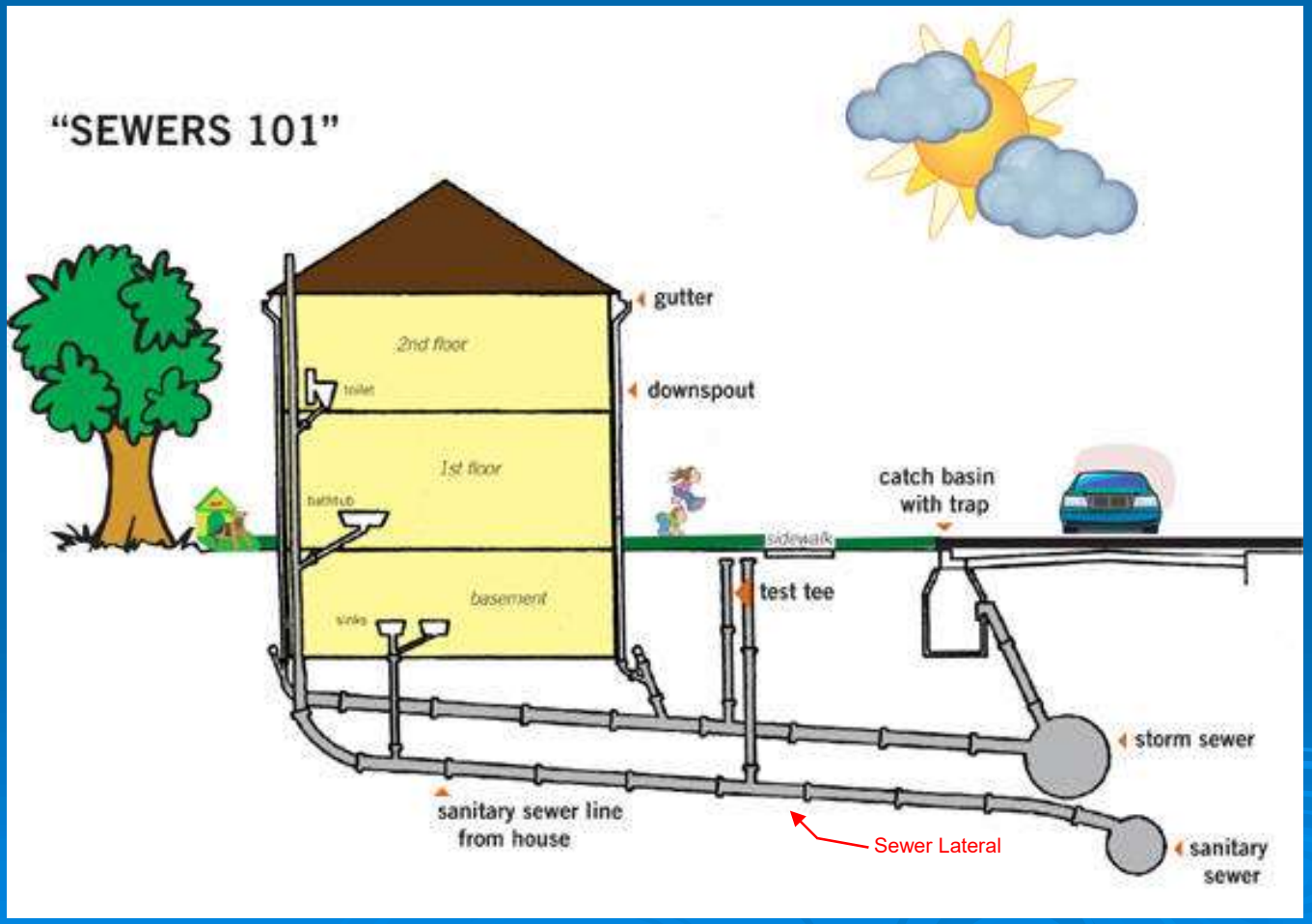
UCSD FAST FACTS

- Serve 155,000 persons in Champaign, Urbana, Savoy and Bondville
- Two Treatment Plants – Northeast and Southwest
- Average Day Flow of 25.28 MGD
- Peak Hour Flow of 74.6 MGD

UCSD SEWER SYSTEM FACTS

- 95 Miles of Interceptor Sewers (10-54 inch dia)
- 36 Miles of Collector Sewers (6-8 inch dia)
- 2,801 Manholes
- 18 Miles of Force Mains (4 to 24 inch dia)
- 28 Lift Stations

TYPES OF SEWER SYSTEMS



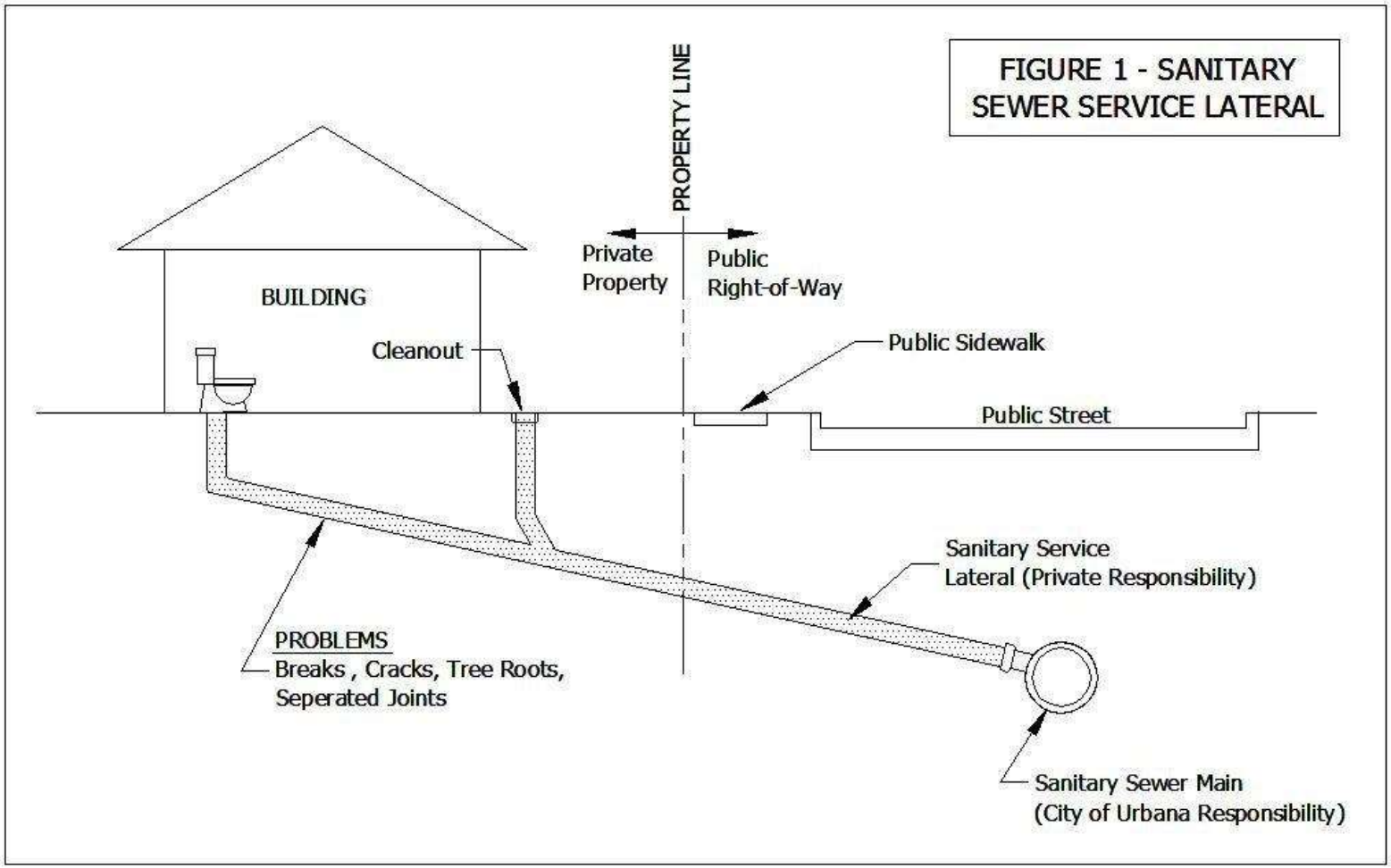
SANITARY SEWER SYSTEM INFRASTRUCTURE

- Gravity sewers
- Manholes and Clean-Outs
- Lift Stations
- Valves – Air/Vacuum Relief and Isolation
- Force Main

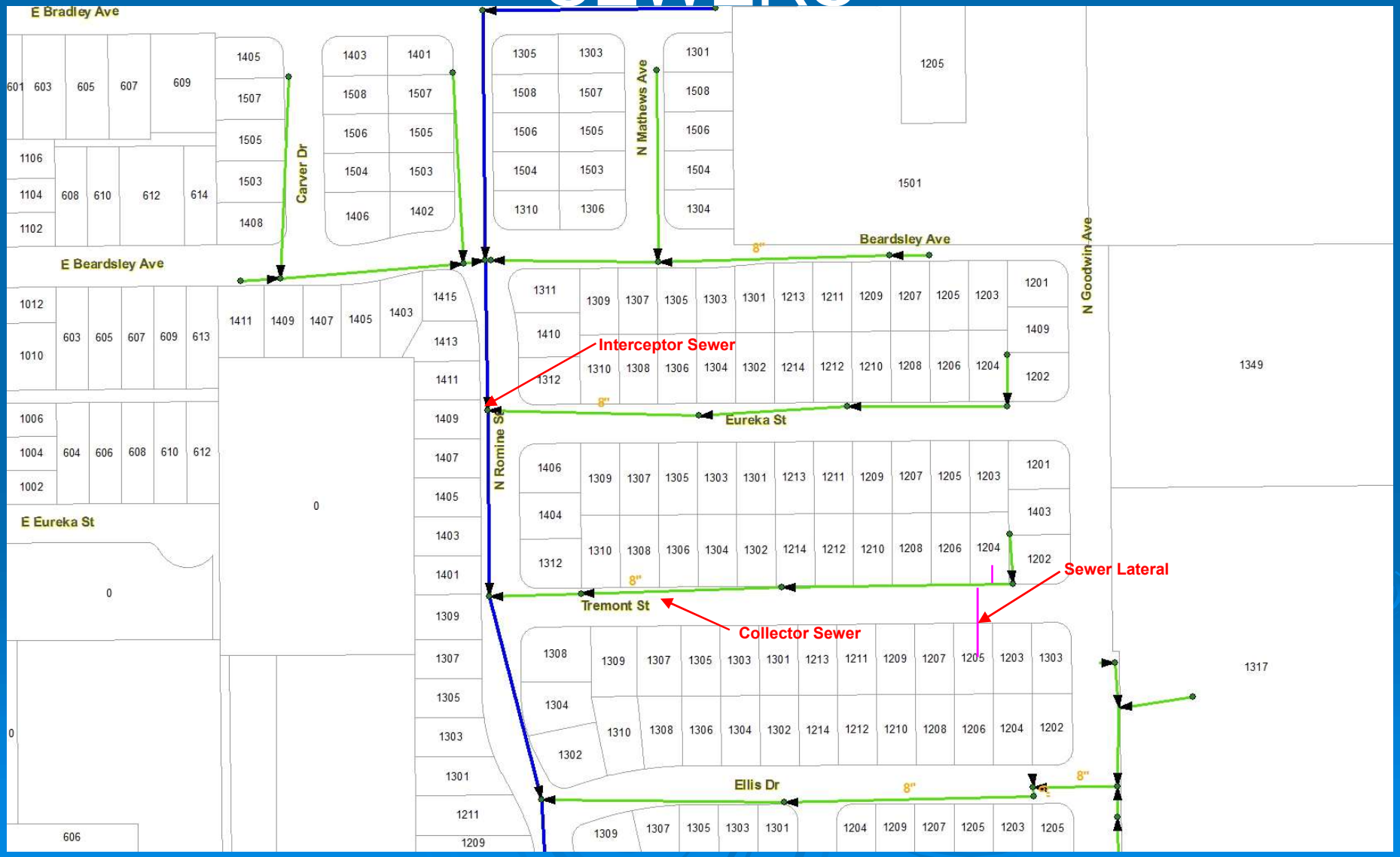
OWNERSHIP OF SANITARY SEWER INFRASTRUCTURE

- SANITARY SEWER INTERCEPTORS – Owned by UCSD
- COLLECTOR SANITARY SEWERS – Village/City Ownership in Village/City Boundaries
- SANITARY LATERALS – Owned by Property Owner

SANITARY SEWER LATERAL OWNERSHIP



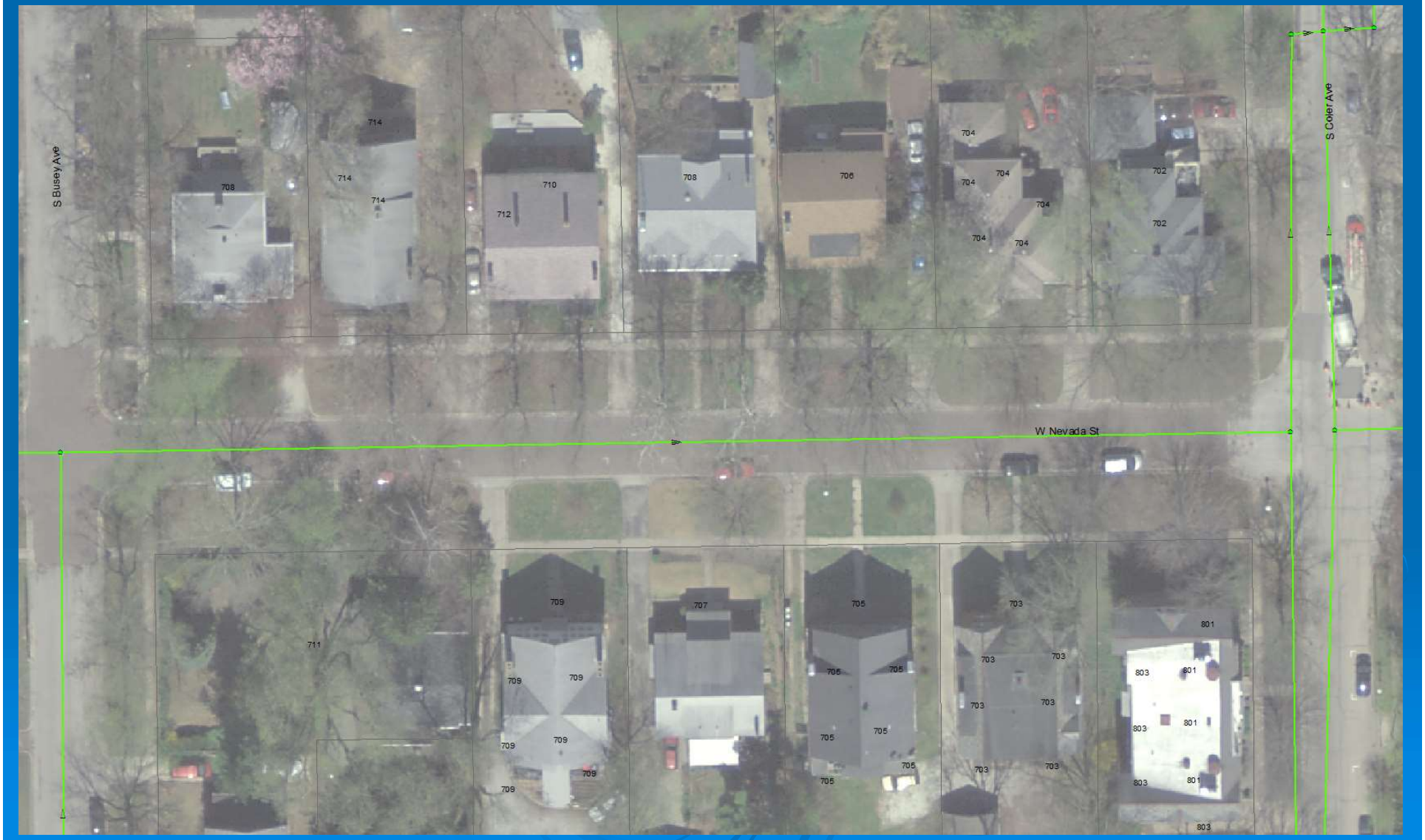
EXAMPLE OF HIERACHY OF SEWERS



LOCATIONS OF SANITARY SEWERS

- Right-Of-Way
- Easements
- Need to be accessible for maintenance

COLLECTOR IN R.O.W EXAMPLE



COLLECTOR IN EASEMENT EXAMPLE

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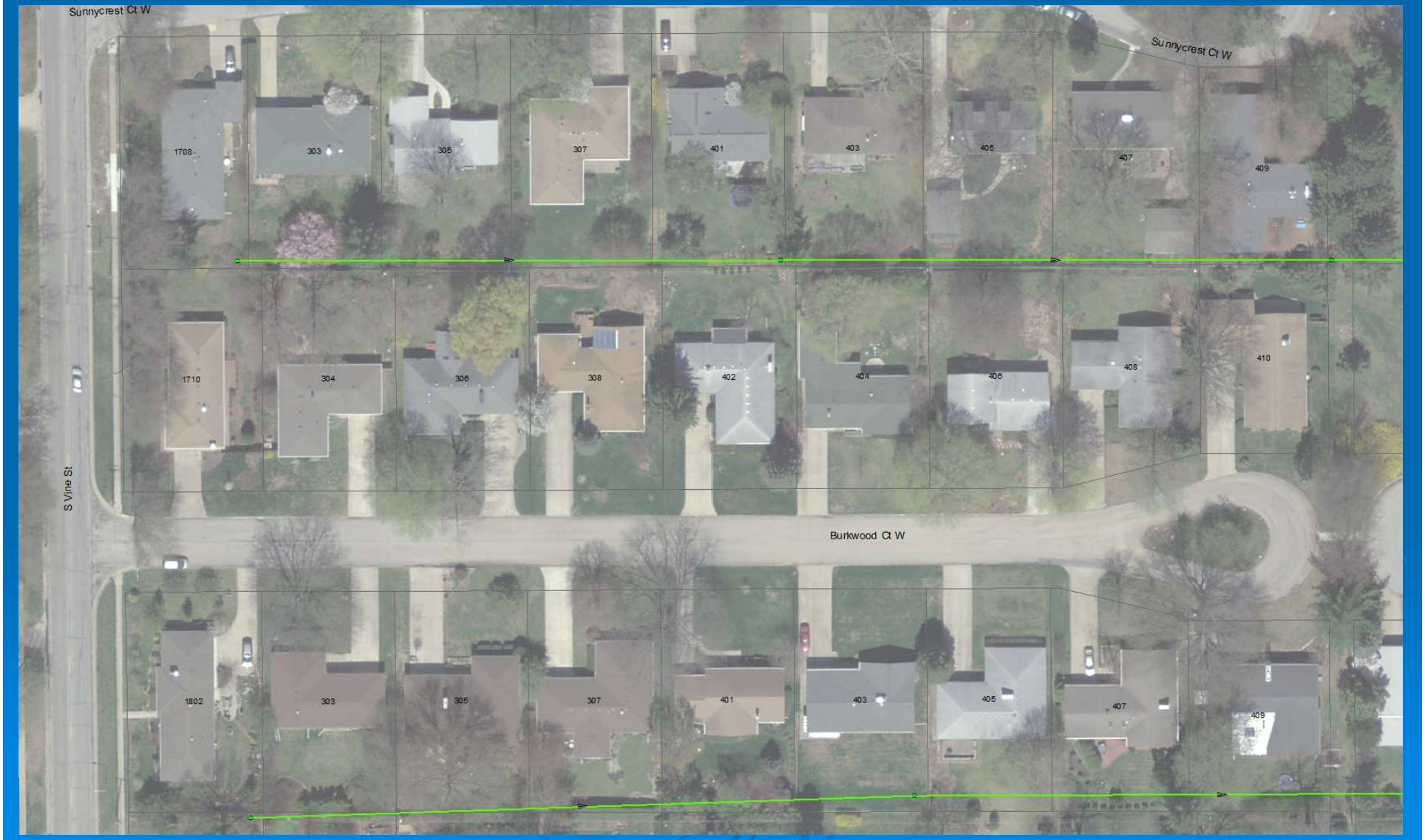
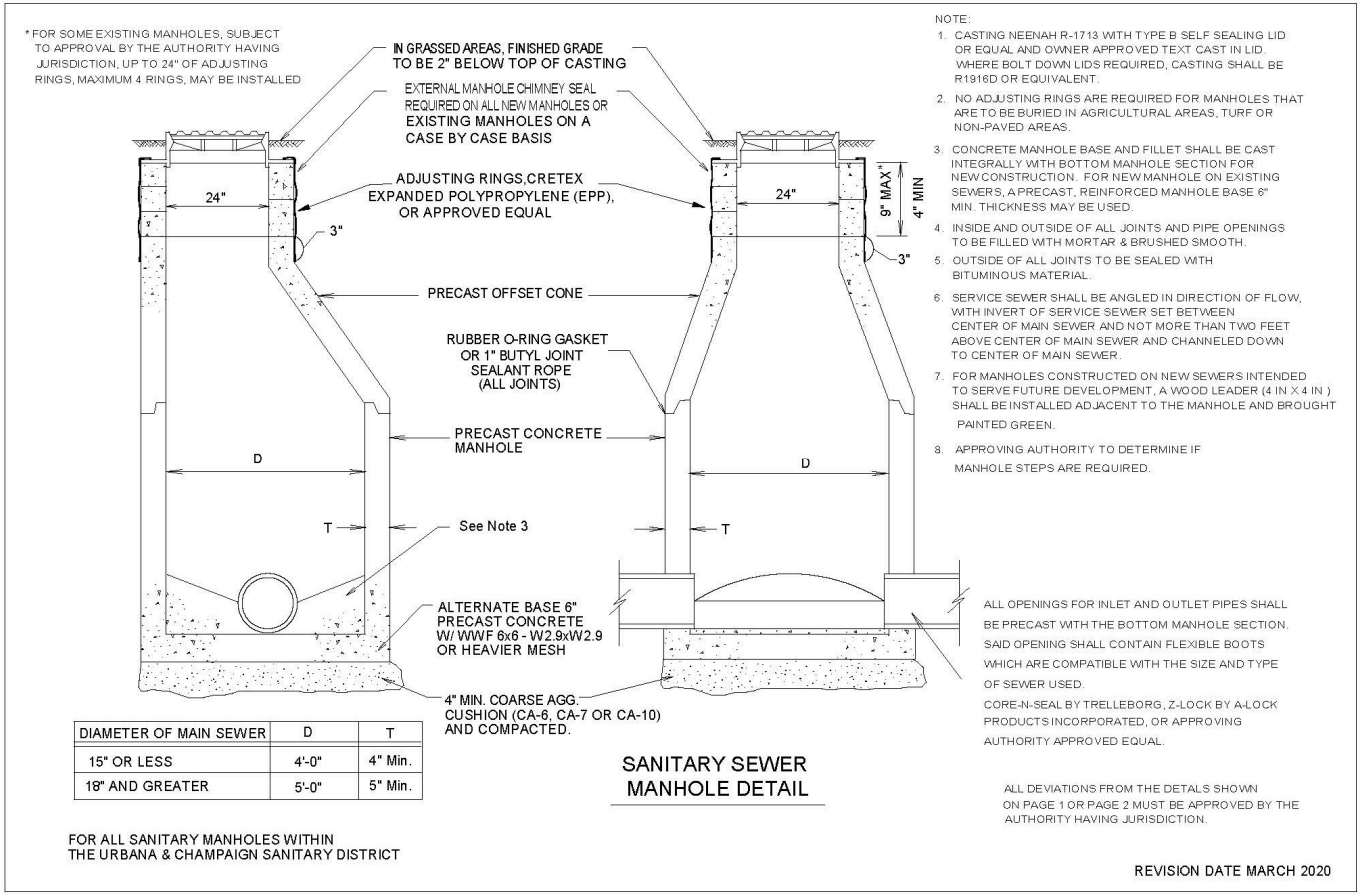


CONSTRUCTION STANDARDS

- Illinois Recommended Standards for Sewage Works – State Standards
- Standard Specifications for Water & Sewer Construction in Illinois – Industry Std
- SSTC Sanitary Sewer Standards – Local Standards

SSTC MANHOLE DETAIL



NOTE:

1. CASTING NEENAH R-1713 WITH TYPE B SELF SEALING LID OR EQUAL AND OWNER APPROVED TEXT CAST IN LID. WHERE BOLT DOWN LIDS REQUIRED, CASTING SHALL BE R1916D OR EQUIVALENT.
2. NO ADJUSTING RINGS ARE REQUIRED FOR MANHOLES THAT ARE TO BE BURIED IN AGRICULTURAL AREAS, TURF OR NON-PAVED AREAS.
3. CONCRETE MANHOLE BASE AND FILLET SHALL BE CAST INTEGRALLY WITH BOTTOM MANHOLE SECTION FOR NEW CONSTRUCTION. FOR NEW MANHOLE ON EXISTING SEWERS, A PRECAST, REINFORCED MANHOLE BASE 6" MIN. THICKNESS MAY BE USED.
4. INSIDE AND OUTSIDE OF ALL JOINTS AND PIPE OPENINGS TO BE FILLED WITH MORTAR & BRUSHED SMOOTH.
5. OUTSIDE OF ALL JOINTS TO BE SEALED WITH BITUMINOUS MATERIAL.
6. SERVICE SEWER SHALL BE ANGLED IN DIRECTION OF FLOW, WITH INVERT OF SERVICE SEWER SET BETWEEN CENTER OF MAIN SEWER AND NOT MORE THAN TWO FEET ABOVE CENTER OF MAIN SEWER AND CHANNELED DOWN TO CENTER OF MAIN SEWER.
7. FOR MANHOLES CONSTRUCTED ON NEW SEWERS INTENDED TO SERVE FUTURE DEVELOPMENT, A WOOD LEADER (4 IN X 4 IN) SHALL BE INSTALLED ADJACENT TO THE MANHOLE AND BROUGHT PAINTED GREEN.
8. APPROVING AUTHORITY TO DETERMINE IF MANHOLE STEPS ARE REQUIRED.

DIAMETER OF MAIN SEWER	D	T
15" OR LESS	4'-0"	4" Min.
18" AND GREATER	5'-0"	5" Min.

ALL OPENINGS FOR INLET AND OUTLET PIPES SHALL BE PRECAST WITH THE BOTTOM MANHOLE SECTION. SAID OPENING SHALL CONTAIN FLEXIBLE BOOTS WHICH ARE COMPATIBLE WITH THE SIZE AND TYPE OF SEWER USED. CORE-N-SEAL BY TRELLEBORG, Z-LOCK BY A-LOCK PRODUCTS INCORPORATED, OR APPROVING AUTHORITY APPROVED EQUAL.

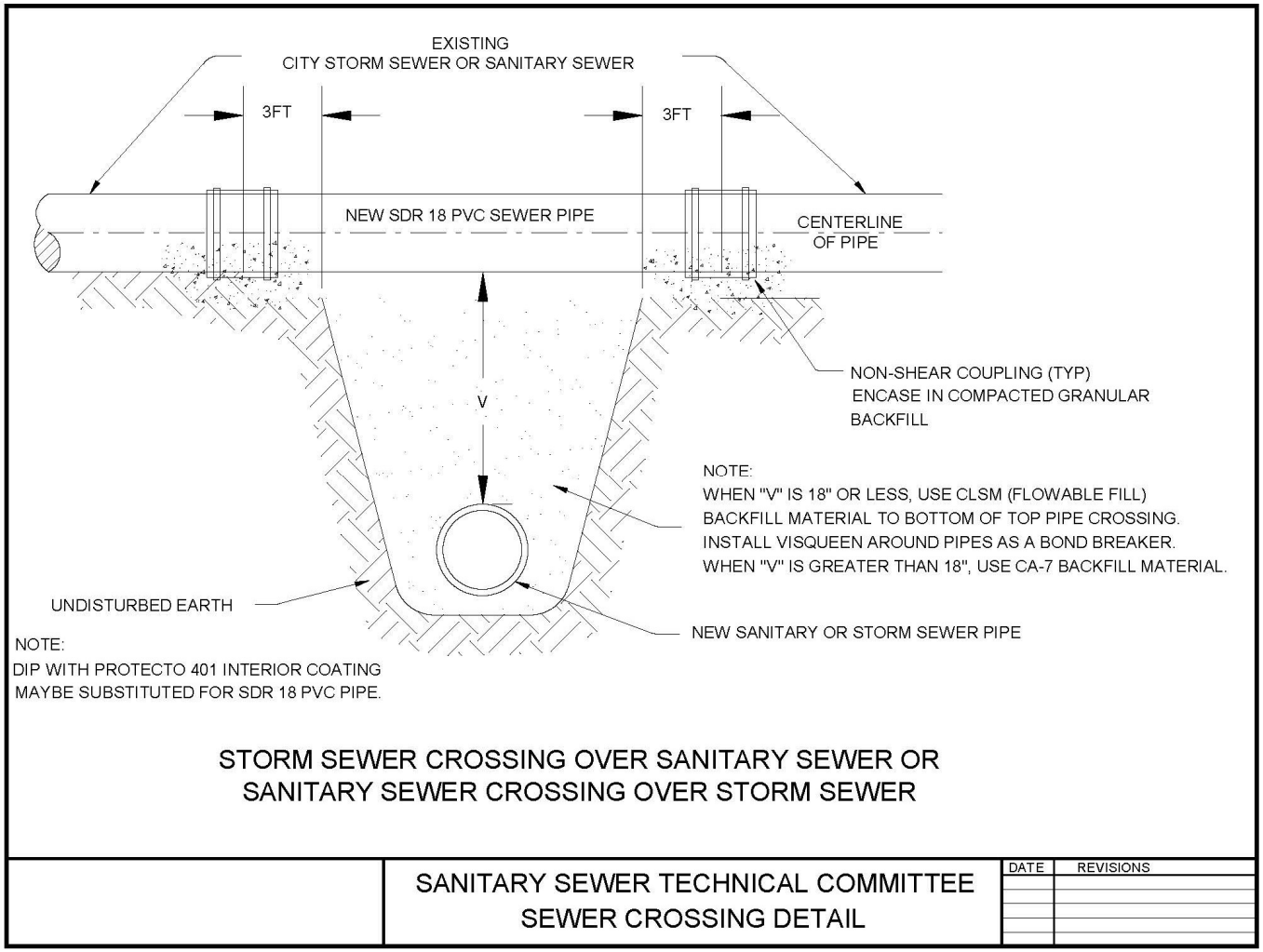
SANITARY SEWER MANHOLE DETAIL

ALL DEVIATIONS FROM THE DETALS SHOWN ON PAGE 1 OR PAGE 2 MUST BE APPROVED BY THE AUTHORITY HAVING JURISDICTION.

FOR ALL SANITARY MANHOLES WITHIN THE URBANA & CHAMPAIGN SANITARY DISTRICT

REVISION DATE MARCH 2020

SSTC PIPE CROSSING DETAIL



SEWER PIPE MATERIALS

- Clay – Not allowed per SSTC
- Concrete - Not allowed per SSTC
- Plastic - SDR 26 PVC or better
- Ductile Iron – Require Internal Coating
- HOBAS

Bell and Spigot Gasketed Joints

CLAY PIPE

REINFORCED CONCRETE PIPE

PVC PIPE

DUCTILE IRON PIPE

HOBAS PIPE

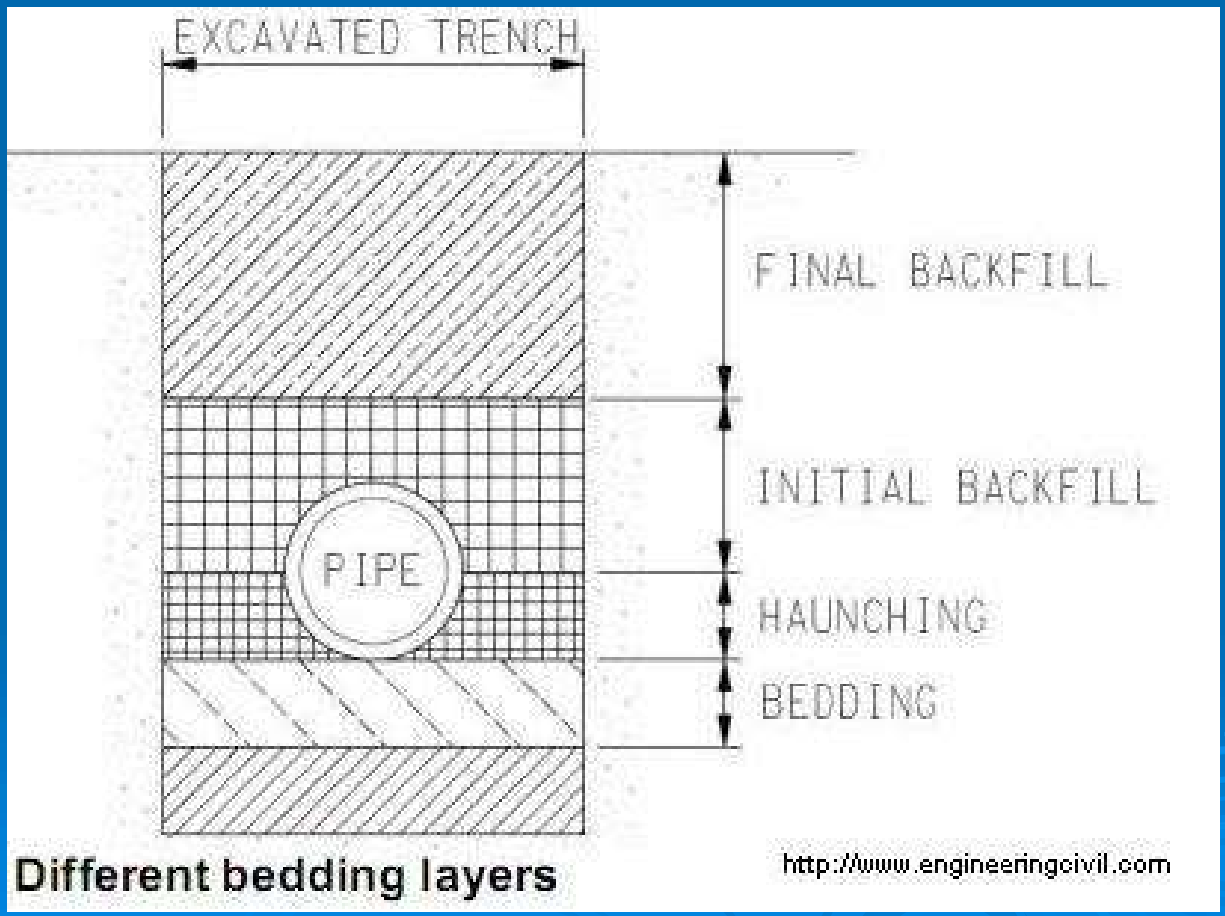
WYE CONNECTION

LINED MAIN TAP

SLOPE

Pipe Diameter (inches)	Slope (Percent)	Flow (MGD)
8	0.4	0.49
10	0.28	0.75
12	0.22	1.07
15	0.15	1.61
18	0.12	2.35
21	0.10	3.23
24	0.08	4.13

PIPE BACKFILL



PIPE JOINTS

- Stable base
- Proper Alignment
- Gaskets in Proper Position
- Seated properly

NON-SHEAR COUPLING

PRECAST CONCRETE MANHOLE

ADJUSTING RINGS

CHIMNEY SEAL

BENCH AND CHANNEL

MANHOLE BOOT

EXTERNAL MANHOLE DROP

INTERNAL MANHOLE DROP

CONSTRUCTION METHODS

- Open Trench Construction
- Directional Bore
- Bore and Jack

OPEN CUT CONSTRUCTION

DIRECTIONAL BORE

BORE AND JACK

SEWER CONSTRUCTION TESTING

- Pipe Air Pressure or Hydrostatic
- Manhole Vacuum Testing
- Mandrel Testing for Flexible Pipes
- Pipe Television Inspection

SEWER PIPE REHABILITATION

- Cured In Place Pipe Lining (CIPP)
- Point Repairs - Open Trench
- Pipe Bursting
- Slip-Lining
- Grouting

CURED IN PLACE PIPE

CIPP Installation - Bing video

GROUTING PIPE

- Sewer Grouting: Mainline Sewer - Bing video

MANHOLE REHABILITATION

- Cured In Place Lining
- Point Repairs - Open Trench
- Cementitious Coating
- Epoxy or Polyurethane Coating
- Grouting
- Fiberglass or PVC Inserts
- Cast-In-Place Liner

MANHOLE REHABILATATION

- Raven Lining Manhole Rehab - Bing video

QUESTIONS?