

APPENDIX I
MURPHYS SANITARY DISTRICT

Section 1 – General Requirements for Sanitary Sewer Installations

1.01 General

These specifications and all Ordinances of the Murphys Sanitary District shall be considered as part of this section, and all plans, profiles, cut sheets, easements, documents, and details of construction shall conform to the standards established in these Improvement Standards and Specifications.

Reference is also made to the Uniform Plumbing Code currently in effect regulating the installation of building sewers and house drainage systems, copies of which are on file in the office of the Building Department.

Further reference is made to the Health and Safety Code and Title 17 of the Administrative Code of the State of California relating to sewers and sewer districts. All work contemplated in the Murphys Sanitary District shall comply with the applicable regulations in these codes.

Prior to the completion of construction of sanitary sewers, the owner or engineer shall make such arrangements as may be necessary for the operation and maintenance of all sewer facilities including treatment plants and lift stations. Operation and maintenance shall conform to all applicable laws and regulations of the Murphys Sanitary District, the County of Calaveras, and the State of California.

1.02 Right of Way

All public sewers shall be in easements or rights of way dedicated to the public. The minimum width of easement shall be twenty (20) feet.

The easement shall be centered on the sewer line unless otherwise permitted by the District Engineer.

Right of way maps shall be submitted along with construction plans showing the exact location and dimensions of all easements which must pass through private property. The location and width of easements shall be subject to the approval of District Engineer.

1.03 Line Size and Connection Policy

House connection lines may be connected to “live” public sewers. Actual tapping of the “live” public sewer shall be done by District forces.

Single house building sewers shall be a minimum of four (4) inches in diameter.

Joint use (multiple buildings with same side sewer) will not be permitted, unless approved by the Operations Manager on a one by one basis.

In all new subdivision work, the lateral sewers shall be installed at the time the public sewer is constructed. Each lateral sewer shall be referenced to the plan stationing and shall end at the property line with a cleanout.

1.04 Design Criteria

- A. Population density within a sewer service area shall be determined on the basis of actual count, character of proposed development (present and future), and the master plan of land use and zoning. All sewers shall be designed to carry peak flows without surcharging the manholes.

For estimating purposes, the dwelling unit shall consist of 2.5 persons. Flow estimates for industrial and commercial land uses shall require individual study and approval. Discussion of parameters with the District Engineer is advised prior to the study.

Design population estimates including equivalent population for schools, commercial, and industrial uses, shall be indicated on the set of plans submitted for approval.

- B. Design sanitary flow shall be two (2) times the average flow of 140 gallons per capita per day.
- C. Infiltration allowance shall be calculated on the basis of fifty (50) gallons per mile per day per inch diameter of pipe.
- D. All public sewers shall be designed flowing full without head.
- E. Sewer velocity shall be not less than two (2) feet per second when flowing full and shall be restricted to ten (10) feet per second unless special pipe or controls are approved by the District Engineer.
- F. Diameter of gravity sewers shall be determined by the type of pipe and the pipe manufacturer’s recommendation.

- G. Special design problems involving siphons, pumps, force mains, non-residential connections, or other unusual features not covered herein, will require individual study and approval by the District Engineer.

1.05 Sewer Location in Streets and Roads

Where sewer lines are installed in street or road rights of way, they shall be installed between present or future gutters in the roadway as follows:

- A. Whenever possible, all public sewers shall be located five (5) feet southerly or easterly of the center line of the street.
- B. The entire sewerage system to be located within roads or easements shall be designed so that all existing improvements of other utilities will be cleared by the sewer improvements, structures, and laterals, by a minimum of twelve (12) inches.
- C. No sanitary sewer, including house connection, shall be located within fifty (50) feet of a water well, and any sewer between fifty (50) feet and one hundred (100) feet of a well shall be constructed of ductile iron pipe with rubber gasket joints.
- D. Curvilinear alignment of sanitary sewers will be permitted under the following conditions:
 - 1. Minimum radii for pipes to 10" I.D. – 200'.
 - 2. Minimum radii for pipes 12" to 15" I.D. – 300'.
 - 3. In no case will the curvilinear alignment maximum radii exceed that of the pipe manufacturer's specification.
- E. Separation between potable water and storm drain piping shall meet or exceed the minimum requirements of the State of California Department of Public Health.

1.06 Sewer Structures

A. Manholes

Manholes shall be placed at all intersections of sewer lines other than house connection sewers, at all vertical or horizontal angle points, and at intervals not greater than three hundred (300) feet.

Where sewers are installed with curvilinear alignments, the distance between manholes shall not exceed three hundred (300) feet. Where the alignment consists of combinations of compound curves, reverse curves, and curves connected with short tangents, the total distance between manholes along such combinations shall not exceed three hundred (300) feet.

Drop manholes will not be permitted, unless approved by the District Engineer.

The angle of deflection between incoming and outgoing lines in a manhole shall not be greater than ninety (90) degrees.

B. Clean Outs

A clean out shall be placed at least fifteen (15) feet beyond the property line projection at the end of each public sewer.

A clean out may be used in lieu of a manhole for any stub line with a length of one hundred (100) feet or less. Any line more than one hundred (100) feet in length shall have a manhole at the end. Public sewers installed in a subdivision or other development for future extensions shall have a clean out at the end if there are any house connections attached to it, and it is not over two hundred (200) feet in length. Lines longer than two hundred (200) feet shall terminate in a manhole with a five (5) foot minimum stub and plug for future extensions installed at the time the manhole is constructed.

C. Temporary Plugs

Temporary plugs may, with approval of the District Engineer, be used at the end of lines which are to be extended within one (1) year of completion.

D. Pressure Frame and Covers

Pressure (water tight) frames and covers shall be installed where drainage conditions may cause storm waters to inundate sewer structures.

E. Remodeling Structures

All structures to be remodeled shall comply with these standards. Any remodeling of any structure shall be specified and/or detailed on the plans and approved by the District Engineer prior to any remodeling.

F. Special Instructions

Manholes over large pipes, special junction boxes, siphons, pedestals, trestles, traps, pumping systems, force main, bridges, and other unusual structures require specific design approval by the District Engineer.

1.07 Construction Engineering

- A. The Inspector and/or Engineer shall refer to the Special Provisions of the particular job for all details of Construction which may refer to these standards or other recognized standards of construction.
- B. Marking
 - 1. Where curbs and gutters or sidewalks are part of an improvement, each lateral sewer shall be permanently located by imprinting an "S" (2" size or larger) on the curb vertically above the side sewer. Responsibility for providing the marking and for its accuracy shall rest with the Contractor.
 - 2. Engineer's station, structures, and wyes shall be marked on the cut stakes in advance of trenching.
 - 3. In subdivisions, prior to installation of a lateral sewer, the lot corner nearest the lateral sewer, shall be located, staked, and flagged in the field.
 - 4. The end of the house connection laterals shall be marked with a clean out.

1.08 Record Plans (As Constructed)

The Project Design Engineer shall keep an accurate record of all approved deviations from the plans. These are to be utilized in correlation with the Inspector's plans for preparing a complete and accurate set of Record Plans for the permanent records of the District.

The drawings for the project shall be returned to the Project Design Engineer upon completion of work and all construction changes shall be made thereon and the drawings returned to the District.

Section 2 – Construction Requirements for Sanitary Sewer Installations

2.01 Alignment and Grade Control

The grade and alignment of the pipe shall be maintained by use of a method approved by the District Engineer in advance of the construction. The proposed method shall be submitted for review prior to commencing the work.

Horizontal alignment shall be such as to maintain a true line between manholes. Any deviation there from must meet the approval of the District Engineer.

Unless otherwise approved by the District Engineer, line and grade shall be staked by a registered civil engineer or licensed land surveyor. Staking shall be on 50 foot intervals, minimum, for straight lines and 25 foot intervals for horizontal and vertical curves. The District Engineer may at any time check the alignment and grade from staking. Contractor shall take appropriate means to preserve, as is practicable, all stakes, bench marks, and control used in the setting of alignment and grade. Where, in the judgment of the District Engineer, the loss of stakes and/or other reference points from whatever cause, requires restaking, such restaking shall be performed when and as directed by the District Engineer and shall be done at the cost of the owner.

2.02 Sewer Pipes

- A. Minimum pipe size for public sewers shall be six (6) inches.
- B. The minimum acceptable slopes for sewer pipe sizes are as follows unless flatter slopes are specifically approved by the District Engineer:

<u>Pipe Size</u> <u>In Inches</u>	<u>Minimum Slope Ratio</u> <u>In Feet Per Ten Feet</u>
6	.005
8	.0035
10	.0025
12	.002
15	.0015
18	.0012
4 (Building Sewer Line Only)	.020

- C. Minimum pipe cover shall be three (3) feet except as may be classified as follows:
 - 1. Two sack cement slurry cover shall be used when total cover over public sewers is less than three (3) feet, or when other special conditions exist.
 - 2. Two (2) to three (3) feet of cover may require the use of approved bedding encasement or extra strength pipe as directed by the District Engineer.
 - 3. Less than two (2) feet of cover shall require concrete encasement of extra strength pipe as directed by the District Engineer.
 - 4. All pipe lines shall be designed and constructed to a safety factor of 1.5. The Project Design Engineer, during design, shall consider impact and dead loads imposed upon the pipe both during construction and after construction. The construction plans shall show the maximum permissible trench width at the top of the pipe which shall be predetermined by the Project Design Engineer.

A note shall be placed on the plans as follows: *"For trenches in excess of the width as shown on the plans, the Contractor shall adequately reinforce the pipe at his expense upon written approval by the District Engineer."*

2.03 Kind of Pipe

1. Polyvinyl chloride pipe shall be of a type as manufactured under the brand name "Ring Tite PVC Pipe" or approved equal. Pipe shall be polyvinyl chloride plastic gravity sewer pipe with integral wall, bell, and spigot O-ring type joints. Pipe and fittings shall be the extra strength minimum of SDR 35 of the requirements of ASTM designation D-3034. All fittings such as wyees, tees, bends, reducers, and connections shall be the same material and manufacturer as the pipe. Rubber rings shall conform to ASTM designation D-1869. No solvent cement joints shall be used.

All PVC shall have a home mark to indicate full penetration when the joint is made. PVC and fittings shall not be stored with direct exposure to sunlight for any extended period of time as determined by the District Inspector. If storage for a long time is necessary, pipe and fittings shall be covered with opaque material providing for air circulation, or otherwise protected in a manner approved by the District Engineer.

2. All force main pipe shall be a minimum 125 psi PVC water pipe, ASTM designation D-2241, SDR 32.5 with rubber O-ring type joints. Rubber rings shall conform to ASTM designation D-1869. No solvent weld joints shall be used. Storage specifications apply as in PVC above. The District Engineer may require C-900 PVC pipe where circumstances warrant.
3. Ductile iron pipe shall be Class 50.

2.04 Standard Manholes

All manholes shall be of concrete construction and shall conform to the standard details unless otherwise specified. The manhole base shall be pre-cast, conform to ASTM C-470 and shall be placed in accordance with the plans, these specifications, and District Improvement Standards. (See District Standard Detail, SS-2, "Standard Type A Manhole" at the back of these specifications.) Control of water in the manhole excavation shall be to the satisfaction of the Engineer. Precautions shall be taken to assure that sewer pipe entering and leaving the manholes does not move from the installed alignment and grade. Flex connectors at the inlet and outlet of sewer manholes shall comply with ASTM C-923. Sufficient material shall be placed on said sewer lines to prevent such movement. Manhole bottom area shall be compacted to 95% relative compaction prior to placing pre-cast base. Appropriate plugs, as approved by the District Engineer, shall be placed in the ends of the pipes in order to prevent concrete from entering the lines during the manhole pour. In case of straight through lines, the pipe

may be laid through the manhole excavation with the base being poured around the pipe. The upper half of the pipe shall then be cut out to form the channel in an approved method.

Care should be taken to set the manhole barrels at the appropriate time during the cure of the concrete to insure proper penetration and allow for sufficient clearance between the bottom of the barrel and top of the pipe. Initial setting and removal of barrels or rings, or the use of a ring form to make the indentation in the base is subject to approval by the District Engineer.

Sufficient care should be taken during the manhole pour operation to observe the rate of cure of concrete and to properly work the surfaces and channels so as to arrive at the required shapes and surfaces and avoid poor results. The channels shall be shaped in flowing curves as indicated on the drawings to insure proper hydraulic characteristics for the flow of sewage. A smooth, clean, hand-rubbed finish shall be given to the surfaces of the manhole base and to any joint mortar work. Transitions between different sizes of pipes shall be smooth and regular. Excessive concrete, mortar or improperly shaped or surfaced channels shall be chipped back and built up again to insure the proper shape and surface. All cracks, joints, holes, etc., shall be sealed by mortar, sealing compounds or dry pack as approved by the District Engineer to insure water tight manholes with workmanlike appearance.

Care shall be taken in setting of barrels, tapered sections, and risers to achieve good elevation control so that no more than 12 vertical inches of grade rings are necessary to adjust the level of the manhole castings (12 inch maximum between top of tapered section and bottom of manhole casting).

Backfill shall be placed uniformly around the outside of the manhole so as to not create differential forces and the possibility of dislodging the manhole sections.

2.05 Excavation

Except by specific approval of District Engineer, no more than 300 feet of open trench shall be excavated in advance of laying of the pipe. Not more than 50 feet of trench excavation shall remain unbackfilled at the end of each day=s work. The remainder of the trench shall be backfilled, compacted, and open to traffic where applicable. Should open trench be determined to be a safety hazard by the District Engineer, all trench excavation shall be backfilled at the end of each day=s work, or all open trenches shall be covered by means approved by the District Engineer.

All crossings of State highways and County roadways are to be done in compliance with the appropriate permit process.

Width of trench shall be uniform from top to bottom and shall be a minimum of 6" wider than the external diameter of the pipe. The maximum width of the trench measured at the

top of the pipe shall not exceed the external width of the pipe plus 12 inches exclusive of bells, collars, and fittings.

Stripping of top soil and separate storage thereof will be required in areas where it is deemed necessary by the District Engineer to preserve the quality of top soil. Stones shall be removed as necessary to avoid point bearing.

Shoring of trenches shall be in accordance with appropriate State and Federal safety regulations and the dictates of good construction practice. Safe access to the trench for inspection purposes shall be provided at all times. The requirements of the California Division of Industrial Safety shall be complied with. Instructions or lack thereof from the District Engineer or his representative in no way waives the Contractor=s responsibility with regard to safety.

The depth of the trench shall be in accordance with the lines and grades shown on the plans with proper allowance for bedding and thickness of pipe and for the type of fittings specified. Any portion of the trench excavated below the proper grade shall be backfilled with approved bedding material and compacted to 95% relative compaction at the Contractor=s expense and at the direction of the District Engineer. All areas of unsuitable material required by the District Engineer to be removed shall be replaced in the same manner.

Removal and disposal shall be required of all water entering the excavation. Disposal of water shall be done in a manner to prevent damage and nuisance to adjacent properties or to the public. Sufficient pumping equipment shall be provided in a manner so as to maintain the trench in a dry condition during the bedding and initial backfilling of pipe. Appropriate precautions shall be taken to prevent drainage water from entering the sewer line being constructed.

2.06 Bedding

Bedding for the pipes shall be of a granular material appropriate to the conditions present in the construction. Depending on said conditions, native soil, clean sand, crushed or pit run gravel, pea gravel or road base may be required for pipe bedding. Type, method of placement, and preparation of bedding shall be approved in advance of the construction by the District Engineer and any changes necessitated by the work or available supply of materials shall be approved by the District Engineer. A minimum of six inch (6") compacted depth of bedding shall underlie the pipe in all cases. Bedding shall be placed and shaped to fit the underside of the pipe barrel with excavation made for bells or pipe couplings. Compaction shall not be less than 95 percent.

2.07 Pipe Installation

The pipe shall be laid in conformance with ASTM D2321 and in strict conformity with the prescribed alignment and grade as staked. The pipe shall be brought to the site of work by a manufacturer=s approved method. Pipe laying shall proceed upgrade with the

bell ends of the pipe placed upstream. Each section of pipe shall be laid true to line and grade in such a manner as to form a water tight concentric joint with the adjoining pipe. The interior of the sewer shall be kept clear of all dirt and debris during the work process.

All pipe laying and joining, including the maximum deflection of joints in curved alignment shall be in accordance with the pipe manufacturer's specifications and as directed by the District Engineer.

Bedding shall be shaped to fit the barrel of the pipe and give uniform support throughout its length. In the case of installing small diameter pipe, where practicable, the bedding may be shaped by lifting and dropping one end of the pipe in order to form the bed shape as described. Pipe bedding should be excavated from beneath the bell ends or couplings of the pipe so as to avoid any bridging effect. No wedging or supporting of the pipe with wood or any other type of material than the approved bedding shall be permitted.

Initial backfill shall be placed in an approved manner so that the bottom one-third of the pipe rests on a dense compacted bed of approved granular material. Slicing with a shovel tip, tamping with a T-bar, compaction by foot or other approved mechanical equipment may be used to meet such requirements. In case of light weight pipe (PVC) sufficient material must be placed on the pipe to keep it from moving out of line and grade.

Concrete encasement of the pipe may be required by the District Engineer when special circumstances warrant.

2.08 Backfill

Following the completion of the initial backfill phase, approved backfill material shall be placed and compacted to a depth of 12 inches above the top of the pipe with Class 1 backfill (as defined in Caltrans Standard Specifications Section 25, Aggregate Subbases, Section 1.02A) unless otherwise approved by the District Engineer and shall be compacted to 95 percent. Compaction shall be by approved means. Backfill material shall be deposited in layers not exceeding 8". Each layer shall be watered or dried as required to bring the soil as close as practical to the optimum moisture content for proper compaction. Backfill above the 12 inch point (pipe zone) shall be of suitable material placed and compacted by approved methods depending on the location and the jurisdiction of agencies controlling the surface of the work area. Backfill shall be placed in a manner so as not to damage the pipe line. The size and nature of rock, if any, being placed in the trench backfill is subject to approval of the District Engineer. In no case shall roots, vegetable matter, or otherwise deleterious material be placed in the trench backfill. Each layer of backfill above 12" within public streets shall have a relative compaction of 95%. Each layer above 12" and outside street rights of way shall have a relative compaction of 90%.

2.09 Installation of Casings, Boring and Jacking

In case of installation of sewer line in a casing, whether by trenching methods or by boring and jacking, the grade of the installed casing shall be checked with regard to the design slope of the sewer being installed. The sewer line shall be installed by the method outlined in the Johns-Manville Sewer Installation Manual, latest edition, as amended by specific pipe manufacturer's recommendations, and approved by the District Engineer.

The pipe skids shall be shaped and installed in a manner so as to compensate for any misalignment or grade problems in the installed casings. All procedures and equipment used in the installation of a sewer in the casing shall be subject to prior review and approval of the District Engineer. Any filling, sacking, drainage and protection of the casing ends shall be as directed by the District Engineer.

All requirements of agencies having jurisdiction over the street or other type of embankment through which the casing is placed, shall be observed.

2.10 Cleanup

During the progress of the work the Contractor shall maintain the entire job site in a clean and orderly condition as required by all agencies having jurisdiction. The Contractor shall promptly attend to the concerns of any persons having contact with the work and shall repair or replace any damage caused by his operation as directed by the District Engineer.

Section 3 – Testing Requirements for Sanitary Sewer Installations

3.01 Pipe Line Testing

Gravity sewers and manholes shall be initially tested by the Contractor for tightness after they have been completed and backfill has been placed.

All tests shall be witnessed and approved by the District Engineer or designee. Tests shall be made on each section from one manhole or test tee to the next. Water, air, and equipment for tests shall be furnished and paid for by the Contractor.

Air test for gravity pipe sewer lines shall be performed in accordance with the following:

Before this test is performed, all surface work and final paving must be complete prior to final flushing-balling and all testing.

The Contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor

to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the force of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction.

Immediately following the pipe cleaning described, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reached 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for stabilization before proceeding further. The pressure at the beginning of the test shall not be less than 3.5 psi.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease .5 psi per square inch.

The pipeline shall be considered acceptable, when the time interval for the decrease in pressure exceeds that shown in the table below:

<u>Pipe Size (inches)</u>	<u>Time (in seconds)</u>
6	185
8	245
10	306
12	370
15	460
18	550
24	735

If leakage is greater than that specified above, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the District. Should any repairs to sewer system be necessary, then all surface work and paving repaired must be completed prior to re-test and all costs associated with repairs, surface work, and repaving shall be borne by the Contractor.

3.02 Manhole Testing

Manhole testing shall be by vacuum or water test.

Manholes water tested shall have suitable plugs in the inlet and outlet lines and shall be filled with water to the top of the casting. A one hour maximum absorption period may be required following which the testing of any leakage shall be observed. Maximum leakage shall be determined by the following formula:

LEAKAGE GPM = .001 (Manhole depth) (head above invert or above prevailing ground water*)²
*Whichever is lesser.

EXAMPLE: For a 6 foot deep manhole with dry conditions

$$\text{Leakage} = .001 (6) (6)^2 = .0147 \text{ GPM}$$

Using 7.48 G/CF and 1728 CI/CF the drop in inches can be easily calculated and measured from the casting rim.

If the manhole leakage exceeds the allowable amount, the manhole shall have failed the test and the Contractor shall repair and retest the manhole to the District Engineer's satisfaction.

Manholes tested by vacuum may be allowed by the District Engineer as follows:

All lift holes and inside and outside joints 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. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of ten inches (10") of mercury (approximately five (5) psi) shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine inches (9").

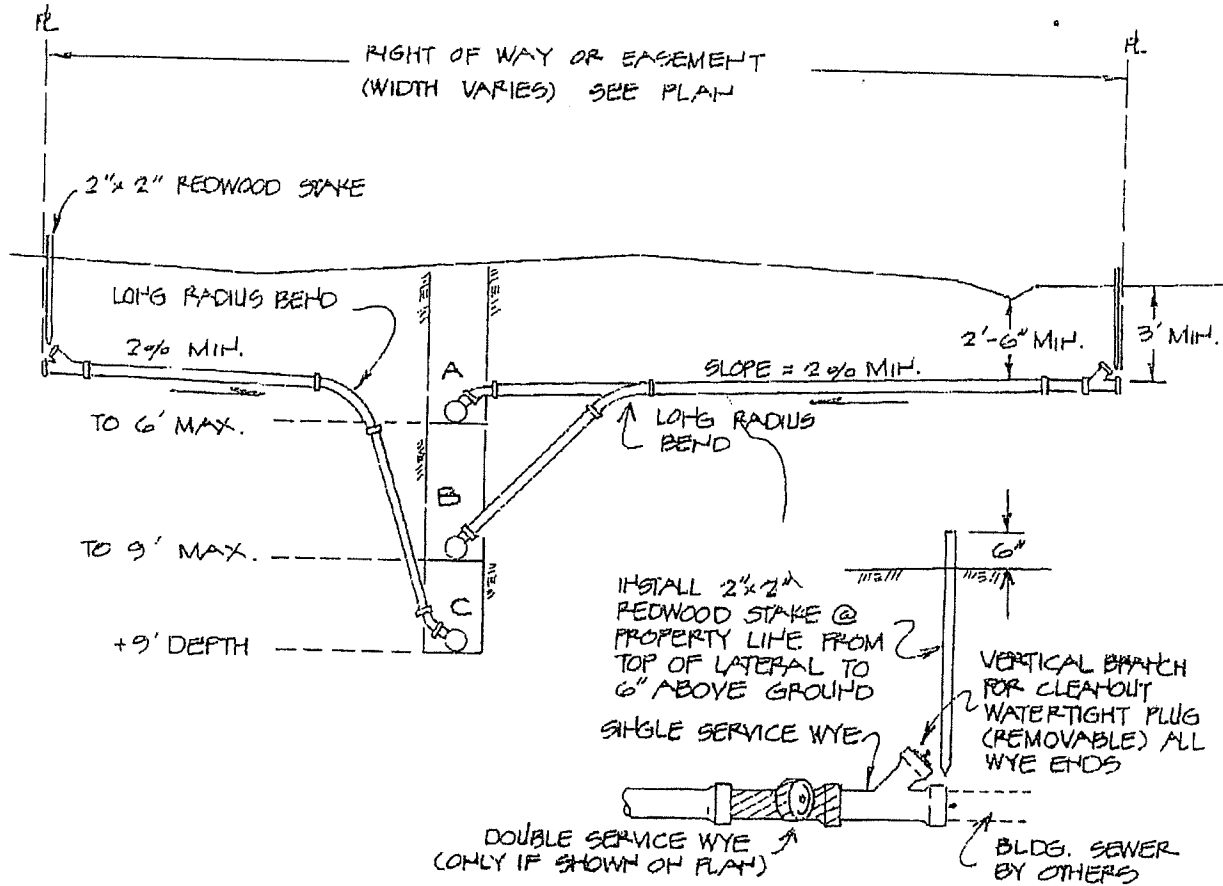
The manhole shall pass if the time is greater than:

60 seconds for 48" diameter manholes

75 seconds for 60" diameter manholes

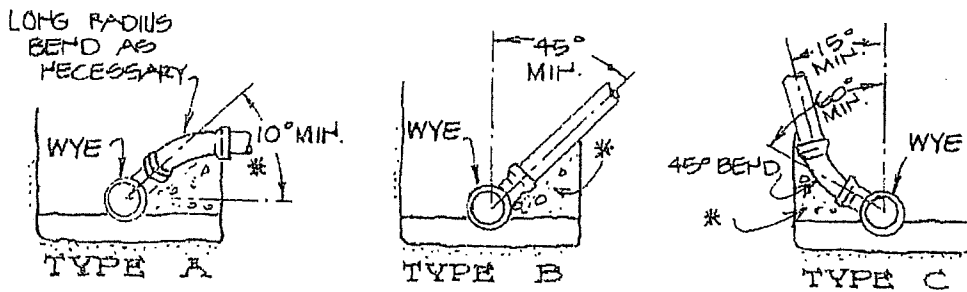
90 seconds for 72" diameter manholes

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



SERVICE ELEVATION

* PLACE CONCRETE 12" WIDE OR WELL COMPACTED BEDDING MATERIAL 18" WIDE UNDER WYE BRANCH AND FITTINGS, AND UNSUPPORTED PIPE. WHEN BEDDING MATERIAL IS USED, PLACE ADDITIONAL MATERIAL TO TOP OF BEND, THE FULL WIDTH OF THE TRENCH.

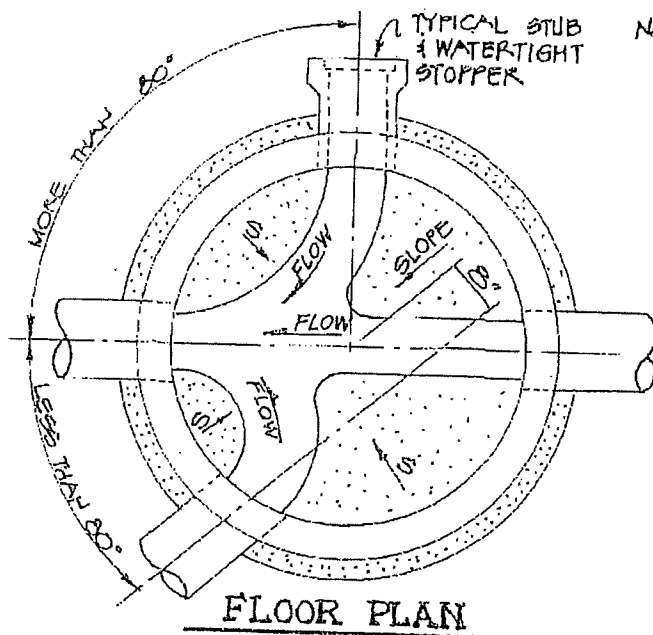


CONNECTION DETAILS

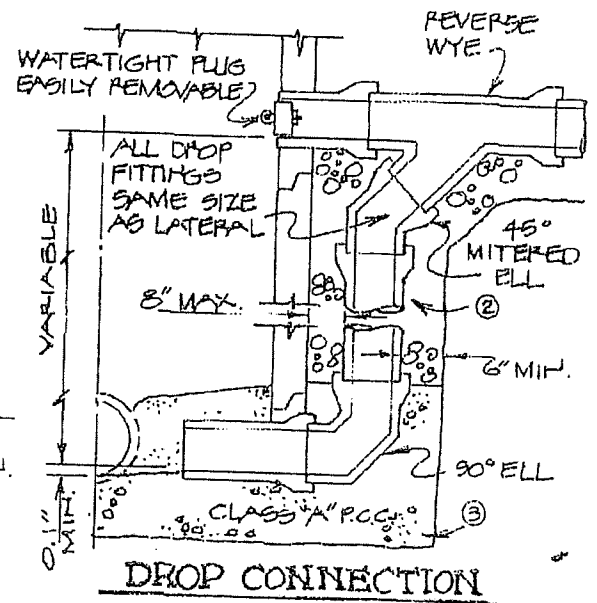
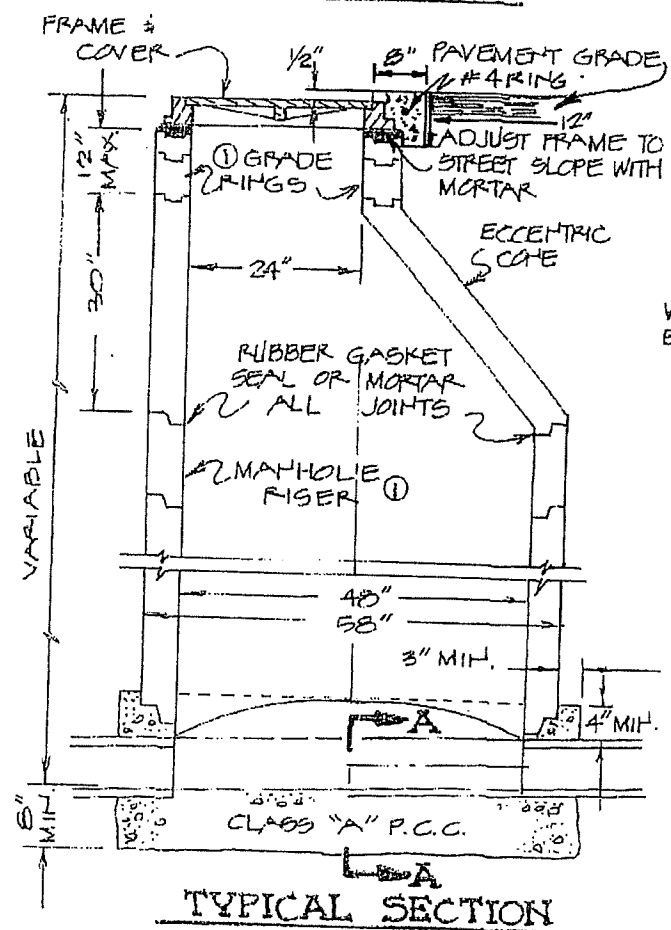
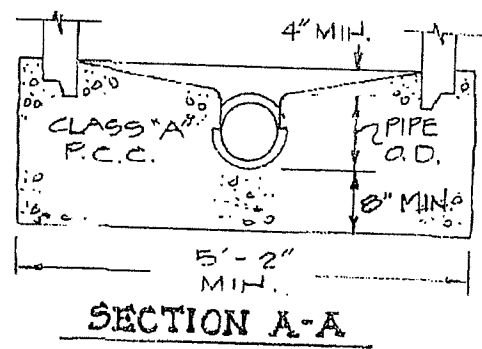
MURPHYS SANITARY DISTRICT
SEWER SERVICE
LATERALS
N.T.S.

	4/29/09	G.G.
REV.	DATE	BY

SS-1



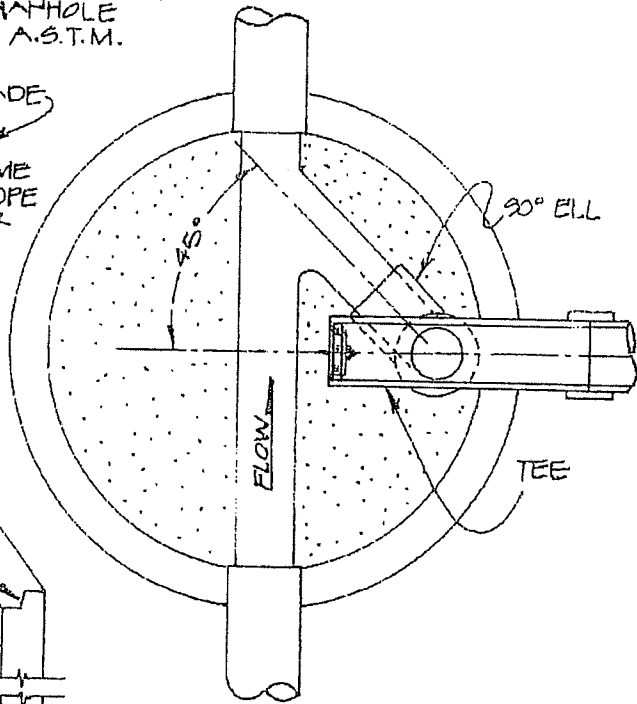
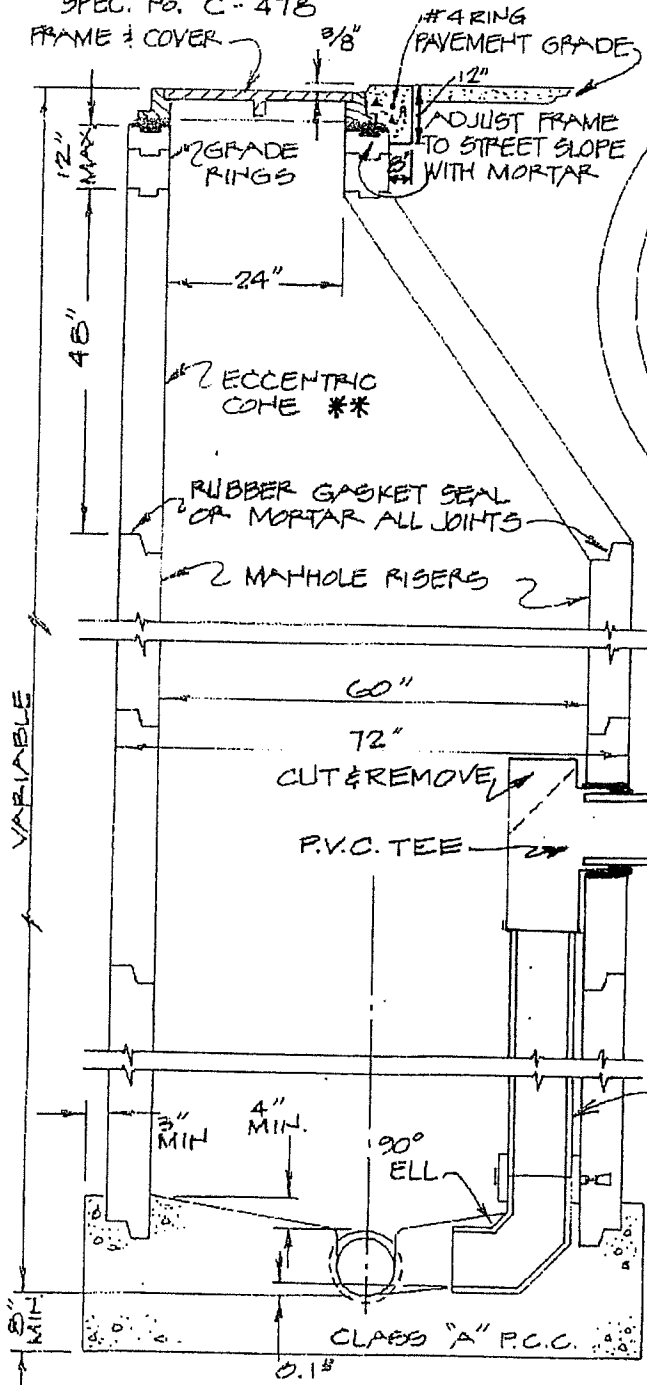
- NOTES: ① REINFORCED CONCRETE GRADE RINGS, CONES, PIPE RISERS OR APPROVED PRECAST MANHOLE SECTIONS SHALL CONFORM TO CURRENT A.S.T.M. SPEC. No. C-478.
- ② SELECT IMPORT MATERIAL, 100% PASSING 3/4" SIEVE & 50% MINIMUM SAND EQUIVALENT.
- ③ ENCASEMENT CONCRETE SHALL BE ROUGH AGAINST UNDISTURBED EARTH.
- ④ ALL INLETS AND OUTLETS FROM MANHOLE STRUCTURES SHALL HAVE A FLEXIBLE JOINT WITHIN 2 FEET OF THE STRUCTURE.



MURPHYS SANITARY DISTRICT
 STANDARD TYPE "A"
 MANHOLE
 N.T.S.

			SS-2
	4/29/09	G.G	
REV.	DATE	BY	

NOTE: REINFORCED CONCRETE GRADE RINGS, CONES, PIPE RISERS OR APPROVED PRECAST MANHOLE SECTIONS SHALL CONFORM TO CURRENT A.S.T.M. SPEC. No. C-478



FLOOR PLAN

CUT & REMOVE
P.V.C. TEE
P.V.C. TEE
SIZE VARIES *
MANLINE OR LATERAL SEWER PIPE x

ALL INTERIOR DROP CONNECTION PIPING & FITTINGS SHALL BE SIZED TO MATCH INLET. *

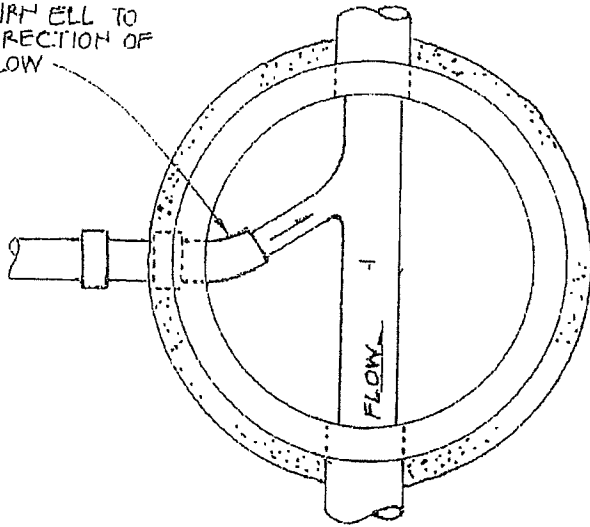
** ECCENTRIC CONE SHALL BE ORIENTED WITH VERTICAL SIDE DOWN STREAM.

TYPICAL SECTION

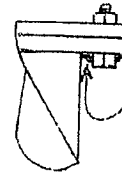
MURPHYS SANITARY DISTRICT
STANDARD TYPE "B"
MANHOLE
N.T.S.

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TURN ELL TO DIRECTION OF FLOW



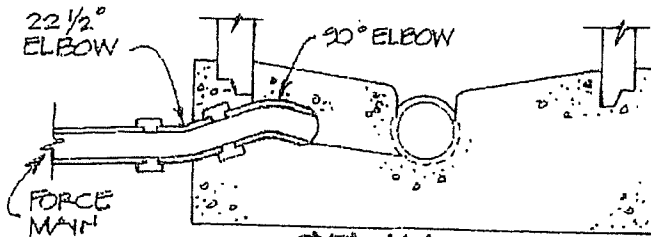
PLAN



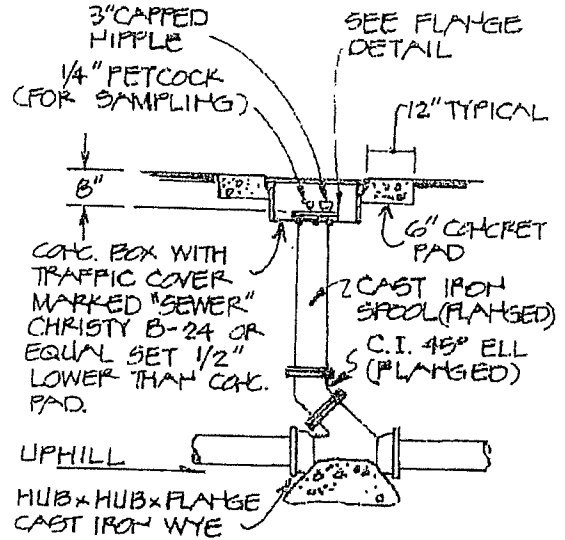
WELD BOLT HEAD TO BOTTOM OF FLANGE

FLANGE DETAIL

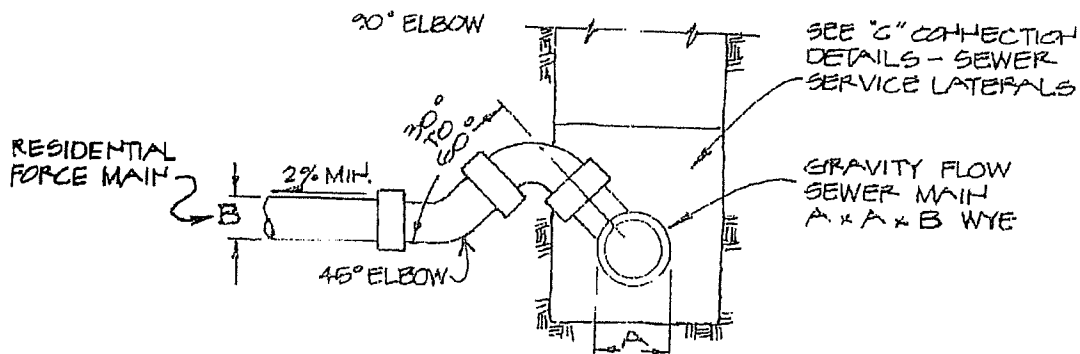
PROVIDE SMOOTH TRANSITION BETWEEN INVERT OF INLET AND OUTLET OF PIPES.



**SECTION
OUTLET CONNECTION
AT MANHOLE**



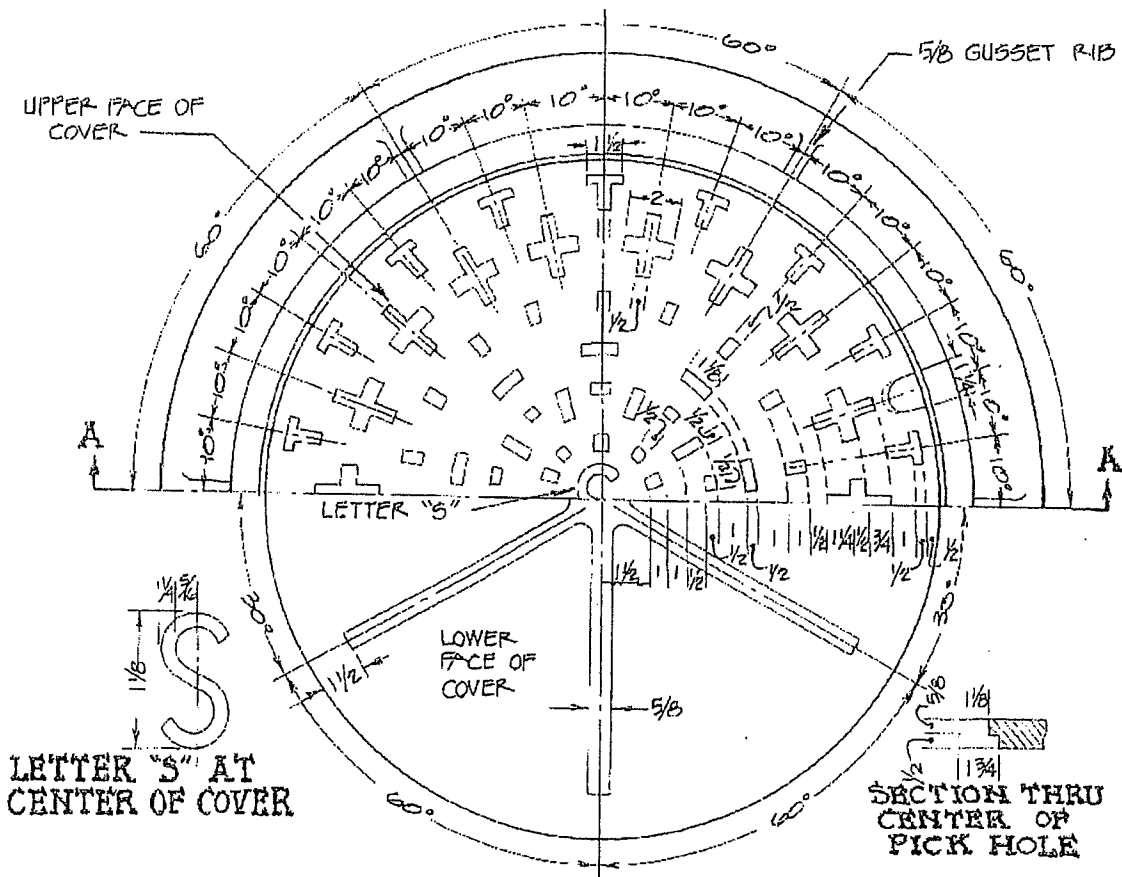
**FLUSHING BRANCH
ASSEMBLY**



SERVICE LATERAL TO GRAVITY MAINLINE

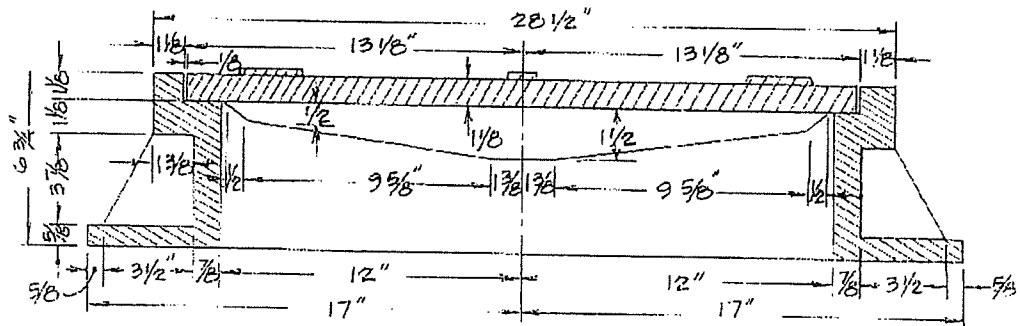
MURPHYS SANITARY DISTRICT
STANDARD FORCE
MAIN DETAILS
N.T.S.

			SS-4
	4/29/09	G.G	
REV.	DATE	BY	



LETTER "S" AT CENTER OF COVER

SECTION THRU CENTER OF PICK HOLE

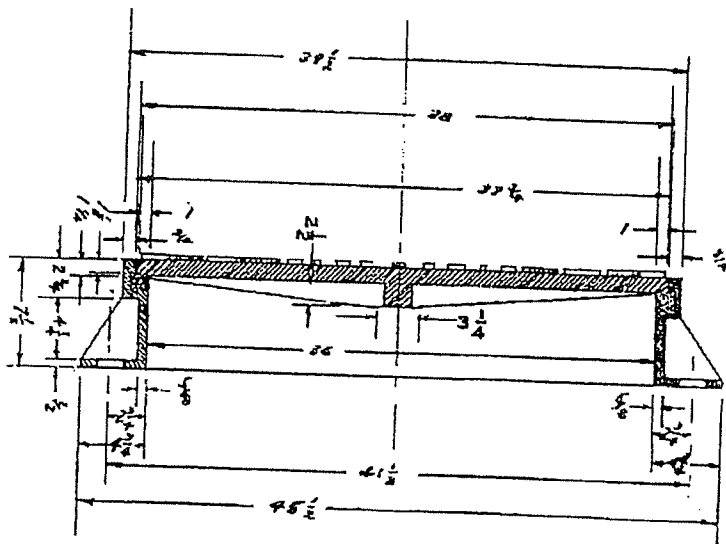
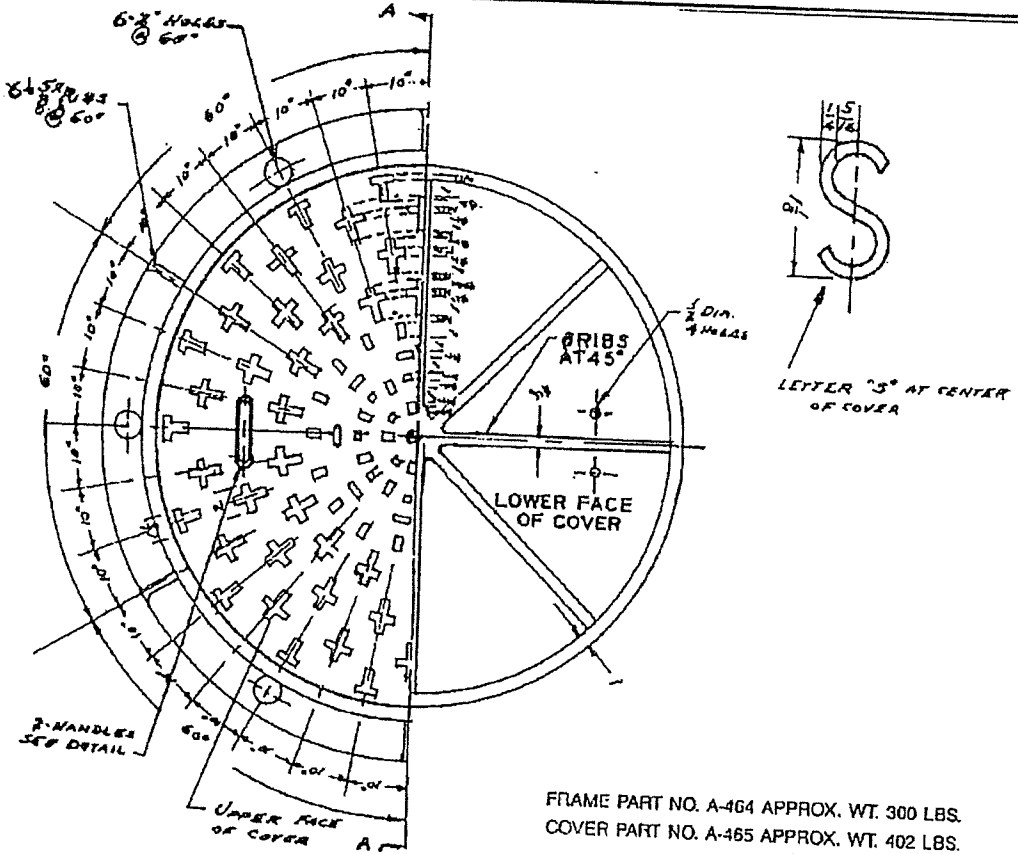


SECTION A-A

CALIFORNIA
 CONCRETE
 PIPE ASSY. A-201
 FRAME - A-202
 COVER - A-203
 APPROX WT. - 385#

MURPHYS SANITARY DISTRICT
 STANDARD MANHOLE
 COVER
 N.T.S.

			SS-5
	4/29/09	G.G	
REV.	DATE	BY	



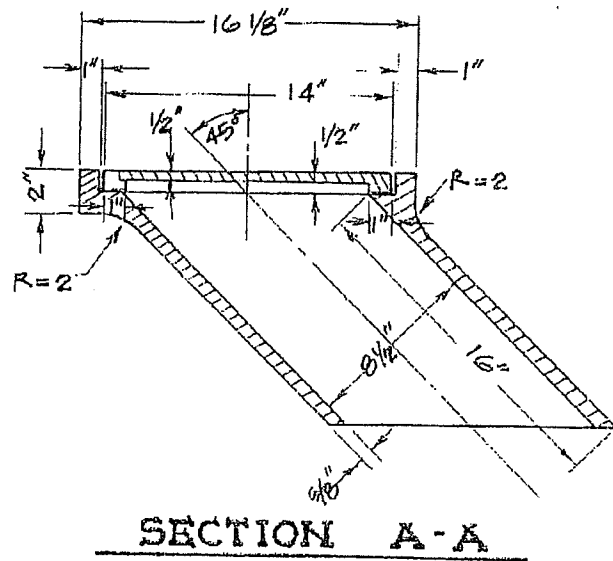
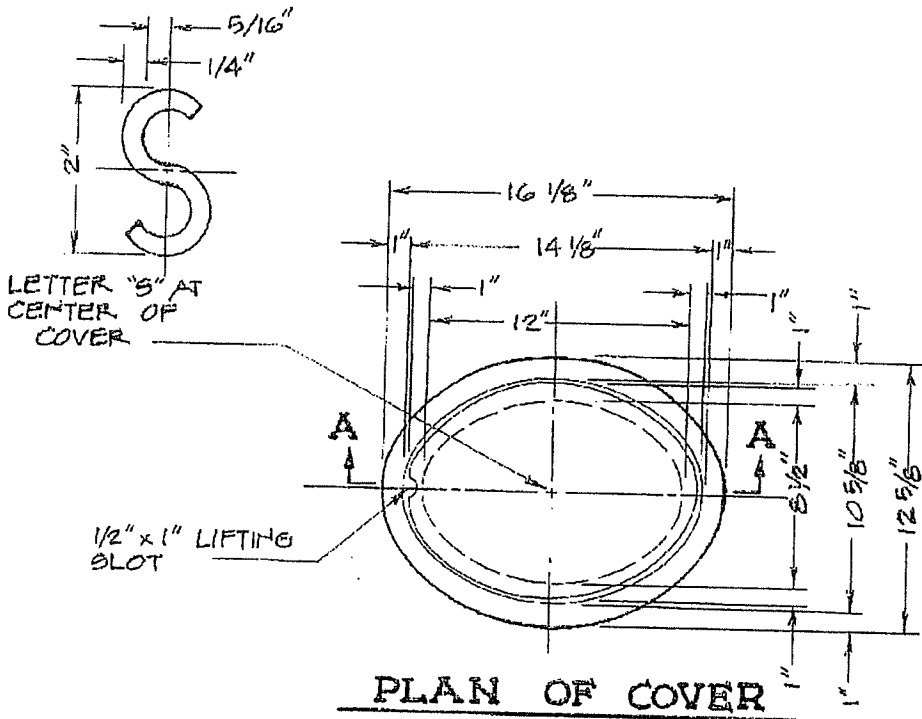
MANHOLE ASSY- 36" & PRESSURE TYPE
BOLT DOWN APPLICATIONS
CALIFORNIA CONCRETE PIPE A-463 ASSY.

MATERIAL CAST IRON APPROX. WT. 702 LBS.

MURPHYS SANITARY DISTRICT
STANDARD BOLT DOWN
MANHOLE COVER

N.T.S.

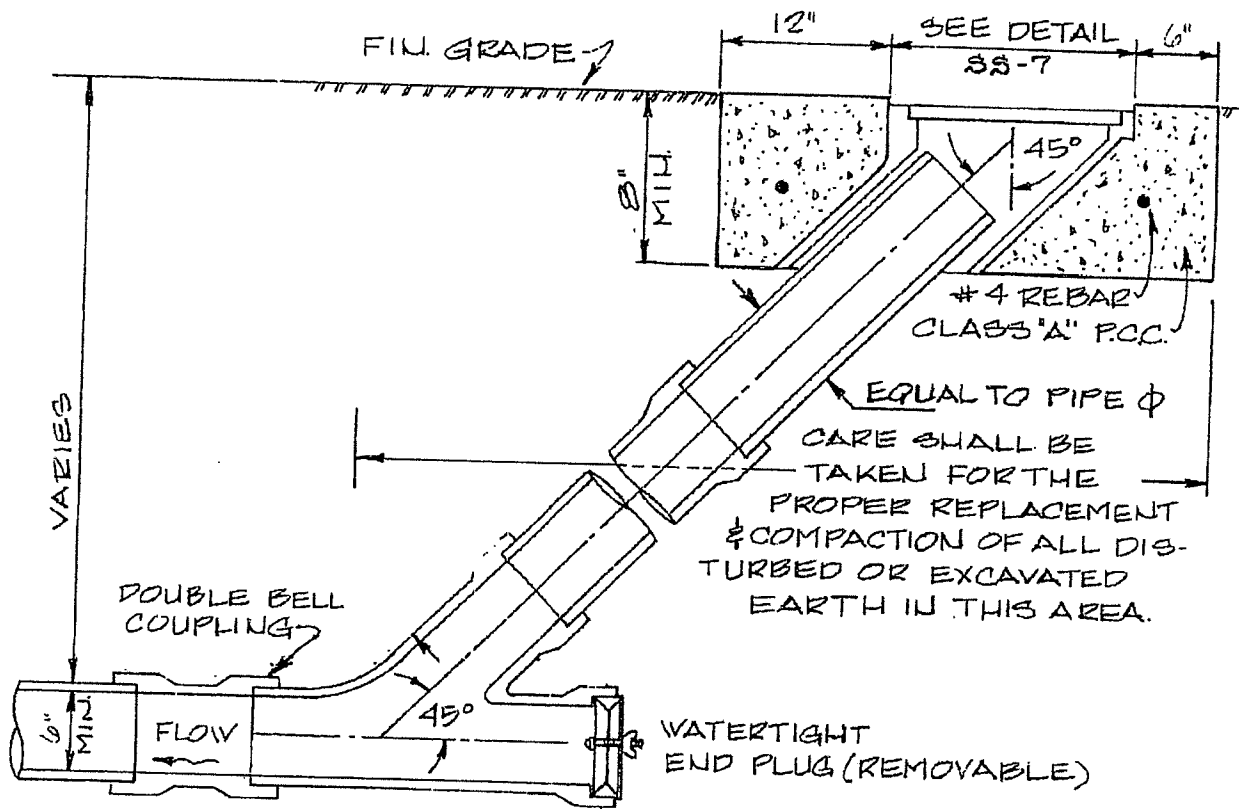
			SS-6
	4/29/09	G.G.	
REV.	DATE	BY	



CALIFORNIA CONCRETE PIPE
A-490 ASSY.

MURPHYS SANITARY DISTRICT
**STANDARD
CLEANOUT**
N.T.S.

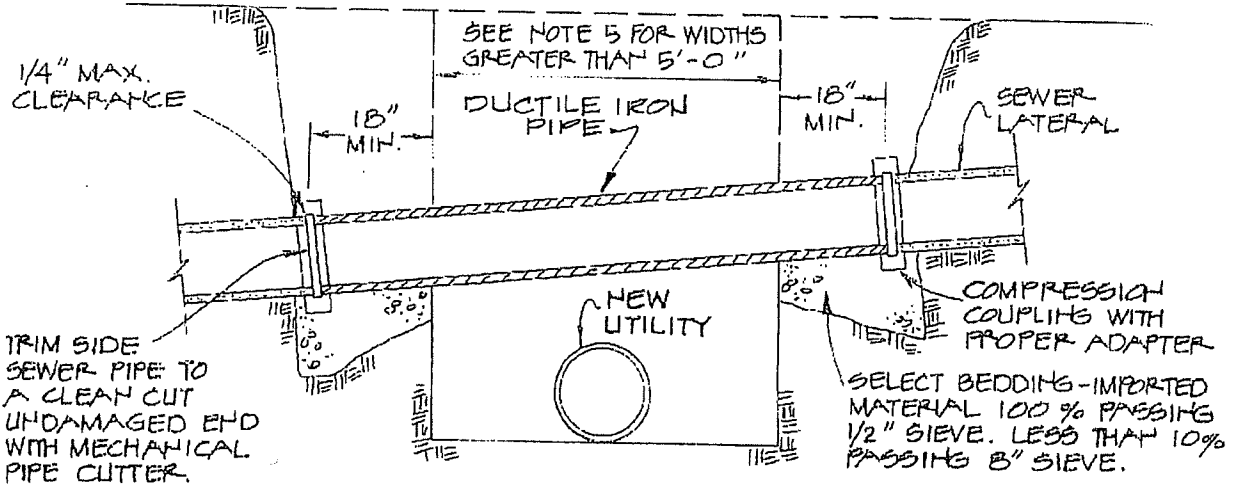
			SS-7
	4/29/09	G.G	
REV.	DATE	BY	



MURPHYS SANITARY DISTRICT
 STANDARD FLUSHER
 BRANCH & CLEANOUT
 N.T.S.

	4/29/09	G.G
REV.	DATE	BY

SS-8

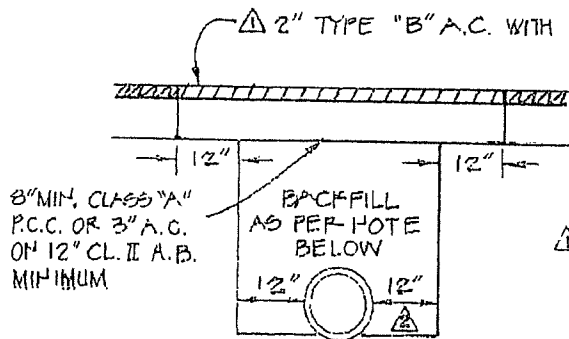


NOTES

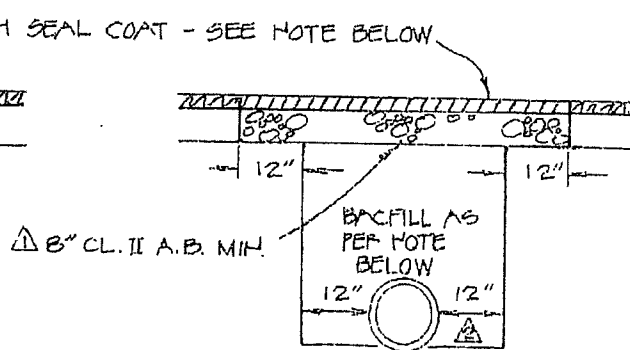
1. INSIDE DIAMETER OF DUCTILE IRON PIPE TO BE THE SAME AS THE PIPE TO WHICH IT CONNECTS.
2. DUCTILE IRON PIPE IS TO BE USED AS PER THIS DETAIL WHENEVER THE SEWER LATERAL IS CUT OR DAMAGED.
3. DUCTILE IRON PIPE IS TO BE USED AS PER THIS DETAIL WHENEVER CONSTRUCTION PASSES BEHEATH THE SEWER LATERAL.
4. ALTERATION OF SEWER GRADES WILL BE PERMITTED ONLY AFTER WRITTEN PERMISSION HAS BEEN RECEIVED FROM ENGINEER.
5. WHENEVER THE SPAN, WHETHER CAUSED BY TRENCH WIDTH OR CROSSING ANGLE OF DUCTILE IRON PIPE EXCEED 5'-0", PLACE SELECT BEDDING TO 6" ABOVE THE CAST IRON PIPE AND 18" EACH SIDE OF ITS CENTER LINE.
6. PIPE CLASSES
 4" CLASS 51 D.I.P.
 6" AND LARGER CLASS 50 D.I.P.

MURPHYS SANITARY DISTRICT
 STANDARD UTILITY
 CROSSING
 N.T.S.

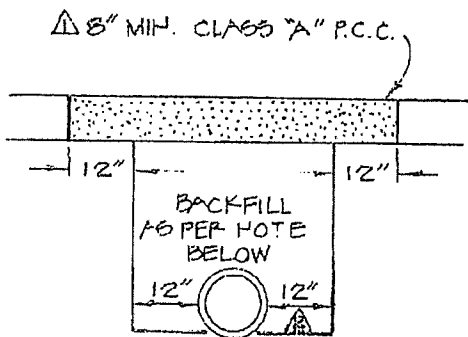
			SS-9
	4/29/09	G.G	
REV.	DATE	BY	



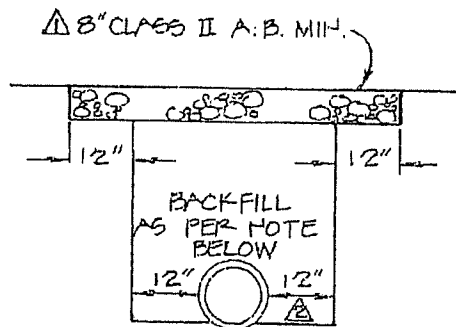
TYPE "A"
ASPHALT CONCRETE STREETS



TYPE "B"
ARMOR COAT OR
SEAL COAT STREETS



TYPE "C"
PORTLAND CEMENT CONCRETE
STREET



TYPE "D"
UNIMPROVED STREETS,
ALLEYS OR EASEMENTS

NOTES:

ALL WORK SHOWN ABOVE SHALL CONFORM TO THE APPLICABLE SECTION OF THE STANDARD SPECIFICATIONS.

ALL EXCAVATION WITHIN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED IN ACCORDANCE WITH SECTION 19-3 OF THE STANDARD SPECIFICATIONS.

AREA ADJACENT TO THE TRENCH SHALL BE LEFT IN A CONDITION EQUAL TO OR BETTER THAN THAT OF EXISTING PRIOR TO CONSTRUCTION.

SEAL COAT - BITUMINOUS BINDER SHALL BE COVERED WITH EITHER SAND OR SCREENINGS TO MATCH EXISTING SURFACE.

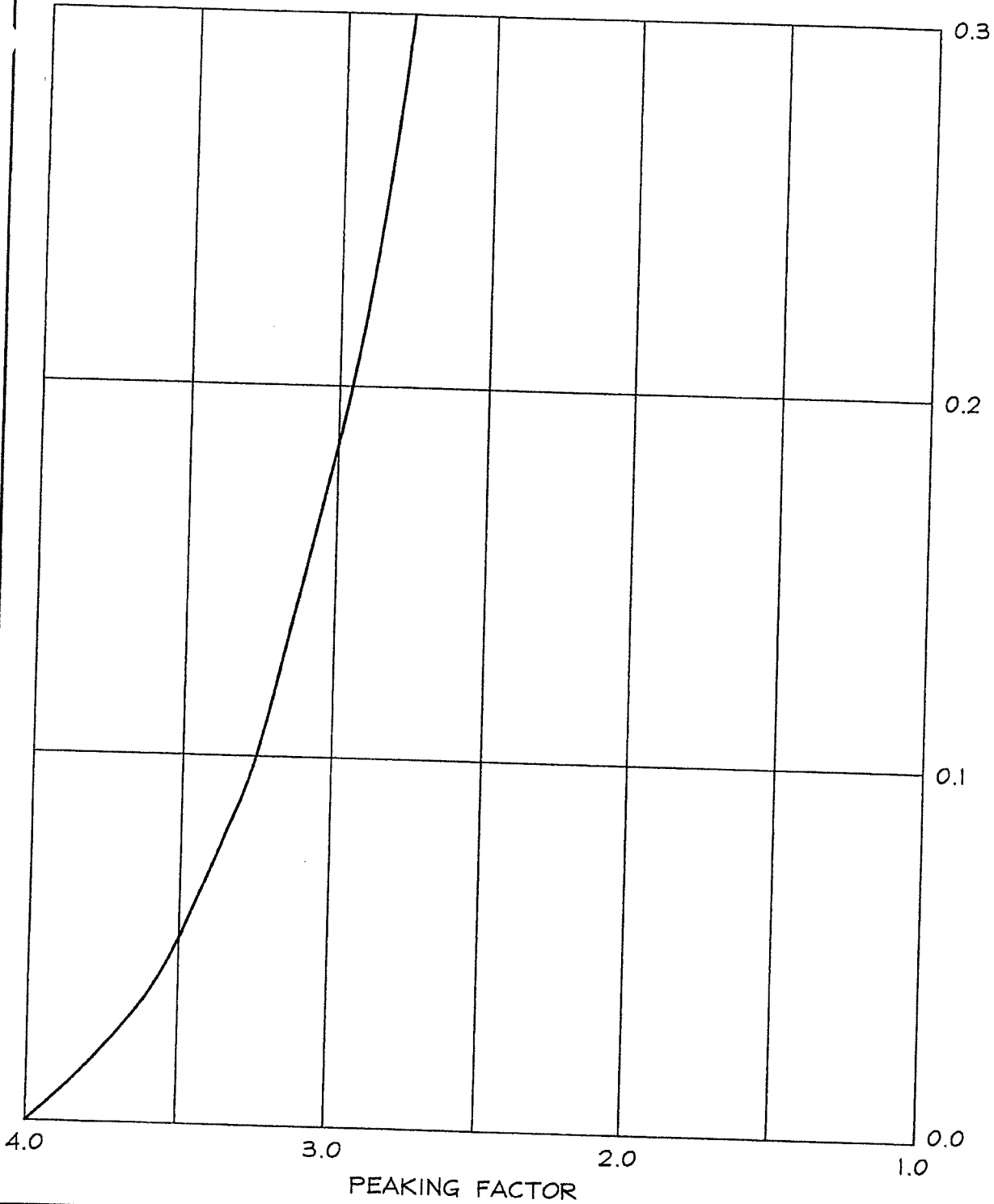
▲ STRUCTURAL SECTION ELEMENTS MAY BE INCREASED WHERE REQUIRED BY THE CITY ENGINEER DUE TO SOIL CONDITIONS AND TRAFFIC CONSIDERATIONS. THE REPLACEMENT STRUCTURAL SHALL EQUAL THE EXISTING STRUCTURAL SECTION AS A MINIMUM REQUIREMENT, EXCEPT THAT THE SECTION SHOWN ABOVE IS AN ABSOLUTE MINIMUM.

▲ MAXIMUM TRENCH WIDTH TO BE 24 INCHES PLUS OUTSIDE DIAMETER OF PIPE TO A HEIGHT OF 24 INCHES ABOVE THE TOP OF PIPE, NO EXCEPTIONS.

MURPHYS SANITARY DISTRICT
STANDARD PAVEMENT
REPLACEMENT & BACKFILL
N.T.S.

	4/29/09	G.G.
REV.	DATE	BY

SS-10



AVERAGE DAILY PROJECT FLOWS (M.G.D.)
RESIDENTIAL SEWAGE PEAK FLOW FACTORS
VS. AVERAGE DAILY FLOW

MURPHYS SANITARY DISTRICT

PEAK FLOW
FACTORS

N.T.S.

	4/29/09	G.G
REV.	DATE	BY

SS-11