MERCER COUNTY

Construction Standards and Drawings

Effective March 22, 2019

300 - ROADWAYS

500 - GENERAL

600 - STORM DRAINAGE

800 - WATER DISTRIBUTION

900 - SANITARY SEWERS

MERCER COUNTY

CHOICE ONE ENGINEERING

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STREET FUNCTIONAL CLASSIFICATIONS

THE COUNTY ENGINEERING DEPARTMENT WILL PROVIDE THE CLASSIFICATION OF ALL STREETS PRIOR TO DESIGN AND CONSTRUCTION. THE CLASSIFICATIONS ARE AS FOLLOWS:

A. ARTERIAL

A GENERAL TERM DENOTING A HIGHWAY PRIMARILY FOR THROUGH TRAFFIC, CARRYING HEAVY LOADS AND LARGE VOLUMES OF TRAFFIC, USUALLY ON A CONTINUOUS ROUTE.

B. COLLECTOR/ RESIDENTIAL

A STREET DESIGNED TO CONDUCT TRAFFIC FROM LOCAL STREETS TO ARTERIALS OR OTHER COLLECTOR STREETS.

C. INDUSTRIAL/COMMERCIAL

A STREET DESIGNED TO CONDUCT TRAFFIC FOR INDUSTRIAL AND COMMERCIAL USES.

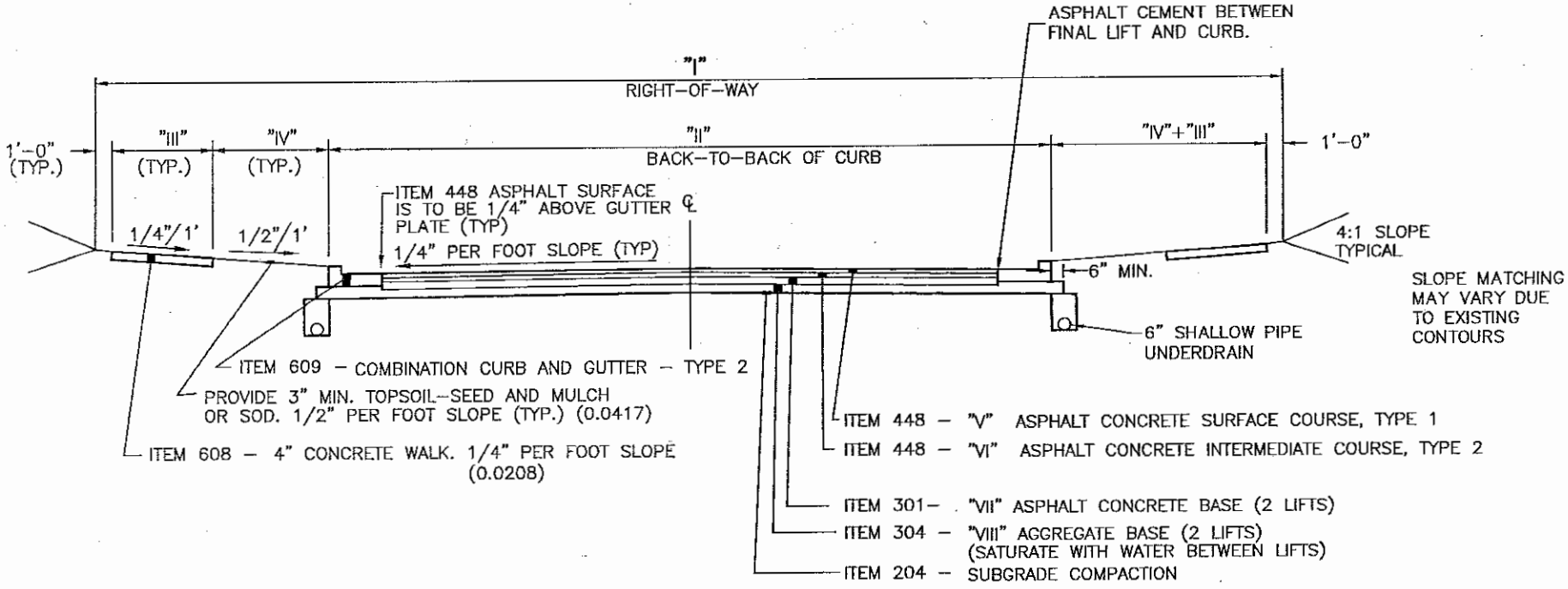
D. LOCAL

A STREET DESIGNED TO PROVIDE ACCESS TO ABUTTING RESIDENTIAL PROPERTY AND DISCOURAGE THROUGH TRAFFIC.

DESIRED MINIMUM STANDARDS				
STREET FUNCTIONAL CLASSIFICATION	RIGHT-OF-WAY WIDTH	BACK-TO-BACK CURB - PARKING BOTH SIDES	BACK-TO-BACK CURB - PARKING ONE SIDE	BACK-TO-BACK CURB NO PARKING
	(L.F.)	(L.F.)	(L.F.)	(L.F.)
ARTERIAL	100	*	*	*
COLLECTOR/RES.	60	36	36	36
IND. AND COMM.	60	41	36	36
LOCAL	60	32**	32**	32**

* SEE DESIGN CRITERIA

** SEE RESIDENTIAL TYPICAL SECTION FOR LOTS 1 ACRE AND LARGER (PAGE NO. 300–3)



MINIMUM STANDARDS

STANDARD DIMENSIONS

ITEM	DESCRIPTION	ARTERIAL	COMM.&IND.	COLLECTOR	LOCAL
I	RIGHT-OF-WAY	100'	60'	60'	60'
II	B\B CURB	–	41'	36'	32'
III	SIDEWALK WIDTH	5'	5'	4'	4'
IV	CURB LAWN WIDTH	6.5'	4.5'	7'	4'
V	ITEM 448	1-1/4"	1-1/4"	1-1/4"	1-1/4"
VI	ITEM 448	1-3/4"	1-3/4"	2-3/4"	2-3/4"
VII	ITEM 301	7"	7"	4"	3"
VIII	ITEM 304	6"	6"	8"	8"

NOTES

A. ALL WORK TO CONFORM TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS LATEST REVISION UNLESS OTHERWISE SPECIFIED.

B. ITEM 407 TACK COAT, SHALL BE REQUIRED WHEN 10 DAYS HAVE ELAPSED BETWEEN BITUMINOUS PAVEMENT LIFTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. APPLICATION RATE IS 0.10 GALLON PER SQUARE YARD.

C. ALL BUTT JOINTS SHALL BE SEALED WITH PG64-22 WITHIN 24 HOURS AFTER PLACEMENT OF ITEM 448.

D. STANDARD DIMENSIONS FOR (II) B\B CURB AND (IV) APRON WIDTH ASSUME PARKING ON BOTH SIDES.

E. SIDEWALK OF 4' WIDTH MAY BE APPROVED BY THE COUNTY ON ARTERIAL AND COMMERCIAL, AND INDUSTRIAL COLLECTORS.

F. NO CONCRETE PAVEMENT WILL BE ACCEPTED.

MERCER COUNTY

CHOICE ONE ENGINEERING

TYPICAL SECTIONS AND ASPHALT PAVEMENT COMPOSITION

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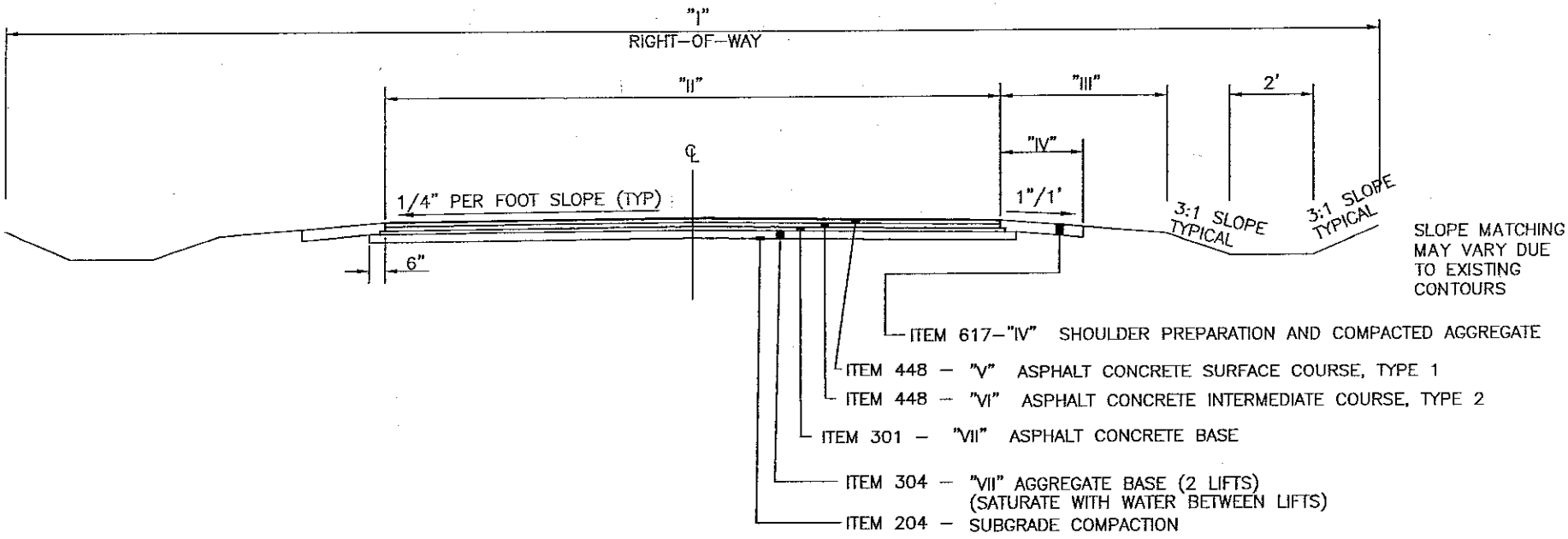

NOTES

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C. ALL BUTT JOINTS SHALL BE SEALED WITH PG64-22 WITHIN 24 HOURS AFTER PLACEMENT OF ITEM 404.

D. NO CONCRETE PAVEMENT WILL BE ACCEPTED.

MINIMUM STANDARDS

STANDARD DIMENSIONS

ITEM	DESCRIPTION	COLLECTOR	LOCAL
I	RIGHT-OF-WAY	60'	60'
II	EP TO EP	28'	24'
III	GRADED SHOULDER	4'	4'
IV	TREATED SHOULDER	2'	2'
V	ITEM 448	1 1/4"	1 1/4"
VI	ITEM 448	2 3/4"	2 3/4"
VII	ITEM 301	4"	3"
VIII	ITEM 304	8"	8"

MERCER COUNTY

CHOICE ONE ENGINEERING

RESIDENTIAL TYPICAL SECTIONS FOR LOTS 1 ACRE AND LARGER

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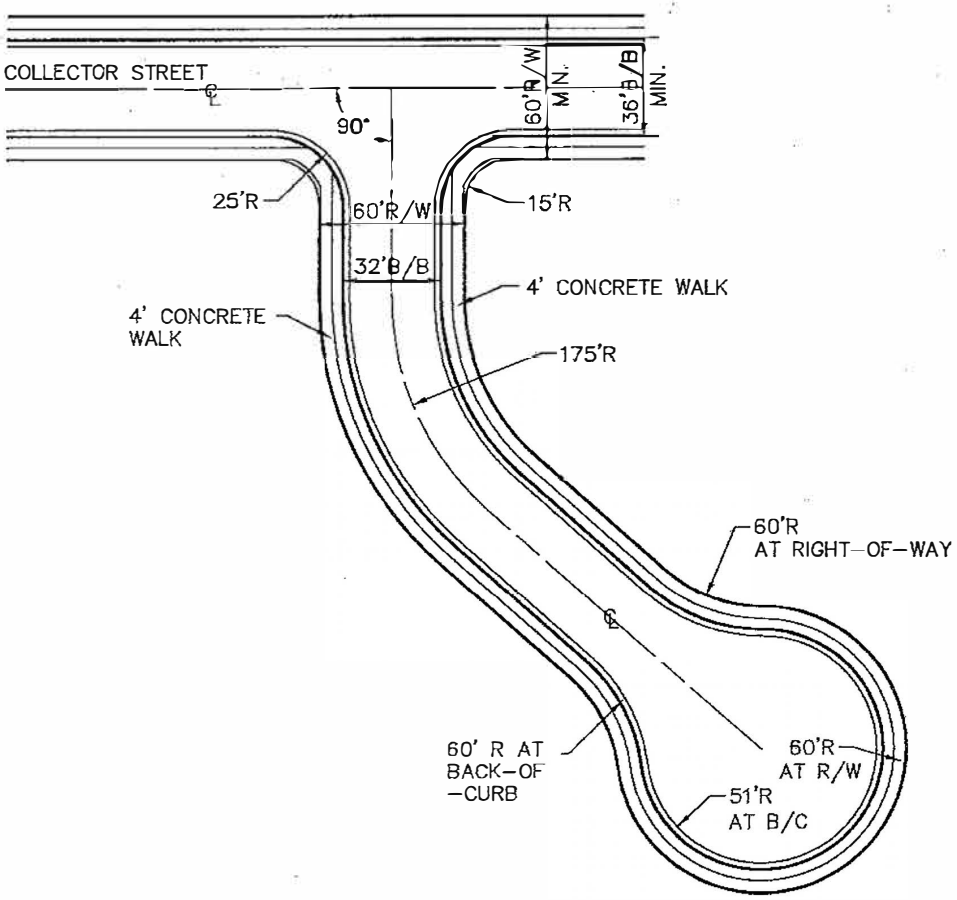
TYPICAL STREET AND CUL-DE-SAC PLAN



STREET DESIGN STANDARDS

	* 25 mph	*35 mph	*45 mph
MINIMUM CENTERLINE GRADES	.40%	.40%	.40%
MAXIMUM CENTERLINE GRADES	10%	7%	4%
MINIMUM LENGTH OF VERTICAL CURVE (SEE NOTE C).	25FT.	50FT.	100FT.
MINIMUM CENTERLINE RADIUS	250FT.	400FT.	600FT.
MINIMUM LENGTH TANGENT BETWEEN CURVES	50FT.	50FT.	100FT.
MINIMUM BACK-OF-CURB RADIUS	25FT.	25FT.	50FT.
MINIMUM HORIZONTAL VISIBILITY	150FT.	250FT.	400FT.
MINIMUM STOPPING SIGHT DISTANCE (MEASURED FROM 3.5' EYE-LEVEL TO 6" OBJECT HEIGHT)	150FT.	250FT.	400FT.
MAXIMUM CENTERLINE GRADE WITHIN 100' OF AN INTERSECTION	3%	3%	3%
RIGHT-OF-WAY WIDTH	60FT.	60FT.	80FT.

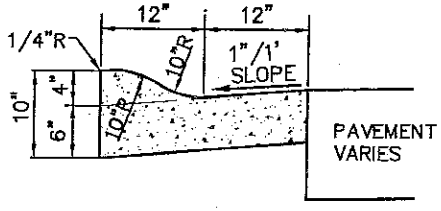
NOTES

A. THESE ARE MINIMUM DESIGN STANDARDS AND MAY BE REQUIRED TO BE INCREASED TO COMPLY WITH THE COUNTY'S OFFICIAL THOROUGHFARE PLAN.

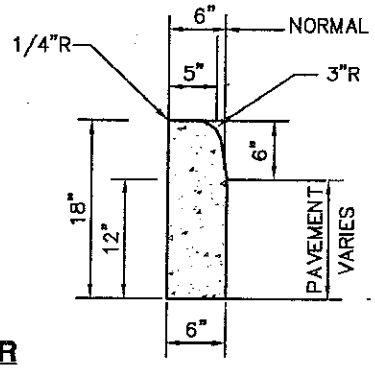
B. THE MAXIMUM LENGTH FOR CUL-DE-SAC STREET SHALL BE 1000' CENTER-OF-STREET TO CENTER OF CUL-DE-SAC UNLESS AUTHORIZED BY COUNTY PLANNING COMMISSION.

C. MINIMUM LENGTH OF VERTICAL CURVE CAN BE REDUCED OR ELIMINATED TO ALLOW FOR PROPER DRAINAGE, WITH APPROVAL OF THE COUNTY.

* THESE ARE DESIGN SPEEDS NOT NECESSARILY POSTED SPEEDS. SEE ODOT MANUAL FOR HIGHER DESIGN SPEEDS.

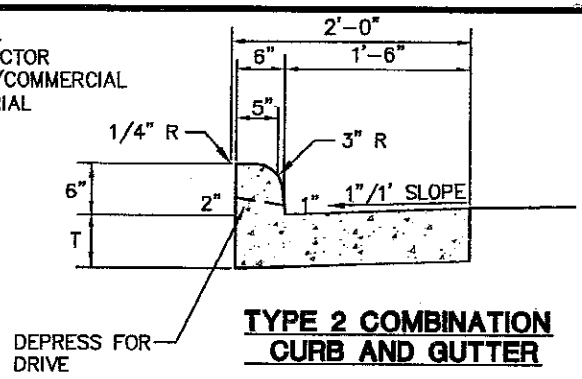


TYPE 1
COMBINATION ROLL CURB AND GUTTER

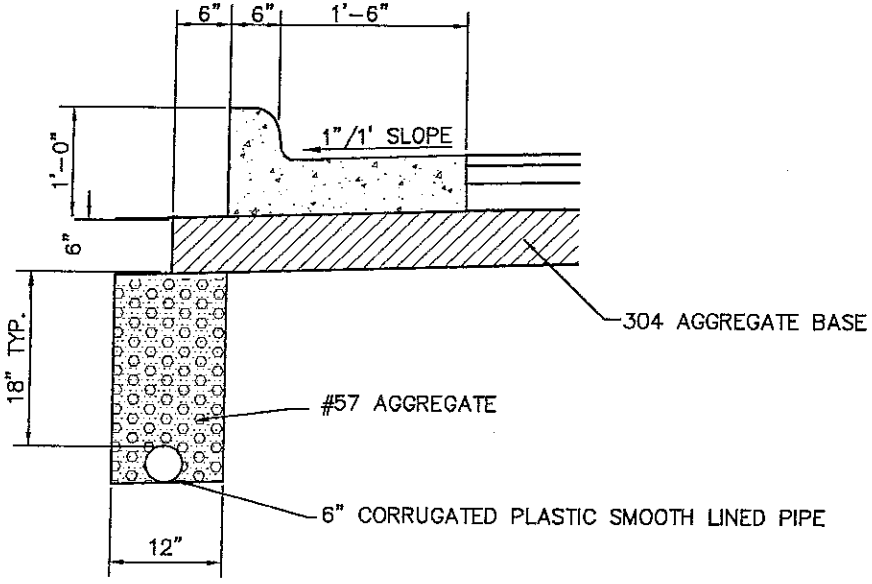


TYPE 6
BARRIER CURB

T=6" LOCAL
T=7" COLLECTOR
INDUSTRIAL/COMMERCIAL
T=8" ARTERIAL



TYPE 2 COMBINATION
CURB AND GUTTER



6" SHALLOW PIPE UNDERDRAIN DETAIL

NOTES

A. CONCRETE AND WORK SHALL MEET THE REQUIREMENT SET FORTH IN ODOT ITEM 609 CURBING.

B. CURBING SHALL HAVE CONTRACTION JOINTS EVERY 10'.

C. MINIMUM OF 6" OF ODOT 304 SHALL BE PLACED UNDER CURBING.

D. CURBING SHALL BE BACKFILLED IMMEDIATELY AFTER FORMS ARE REMOVED OR AS SOON AS PRACTICAL WHEN SLIP FORMING PRIOR TO OTHER CONSTRUCTION OPERATIONS.

E. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

F. APPLY WHITE PIGMENTED CURING COMPOUND ON ALL SURFACES INCLUDING BACK IMMEDIATELY AFTER FINISHING SURFACES. ANY OTHER METHOD OR TYPE OF CURING COMPOUND MUST BE PREAPPROVED.

G. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600LB/CY CEMENT). PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

H. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.

I. TYPE 6 CURBS ARE FOR USE AROUND MEDIAN SECTION.

J. CURB, SHALL BE BLOCKED OUT A MINIMUM OF 5' ON EACH SIDE OF A NEW CATCH BASIN INSTALLATION.

K. UNDERDRAIN MUST BE INSTALLED PRIOR TO CURB INSTALLATION, IF USED.

L. MINIMUM FLOW LINE SLOPE OF PERFORATED PIPE IS 0.003 FT/FT TO OUTLET.

M. UNDERDRAIN MAYBE USED FOR SUMP PUMP DRAINS WITH A MANUFACTURED TEE, WHEN NO OTHER STORM OUTLET IS AVAILABLE AS DETERMINED BY THE MUNICIPALITY. IN NO CASE SHALL DOWNSPOUTS BE TIED INTO THE UNDERDRAIN.

MERCER COUNTY
CHOICE ONE ENGINEERING

CONCRETE CURB DETAILS

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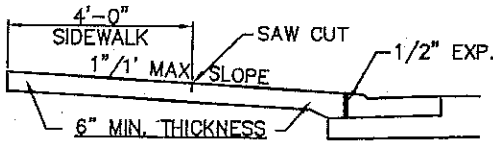
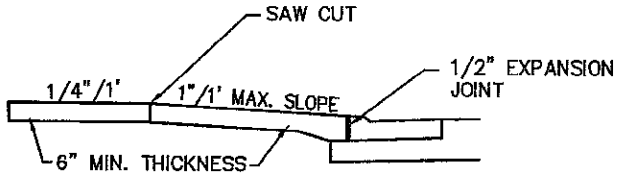
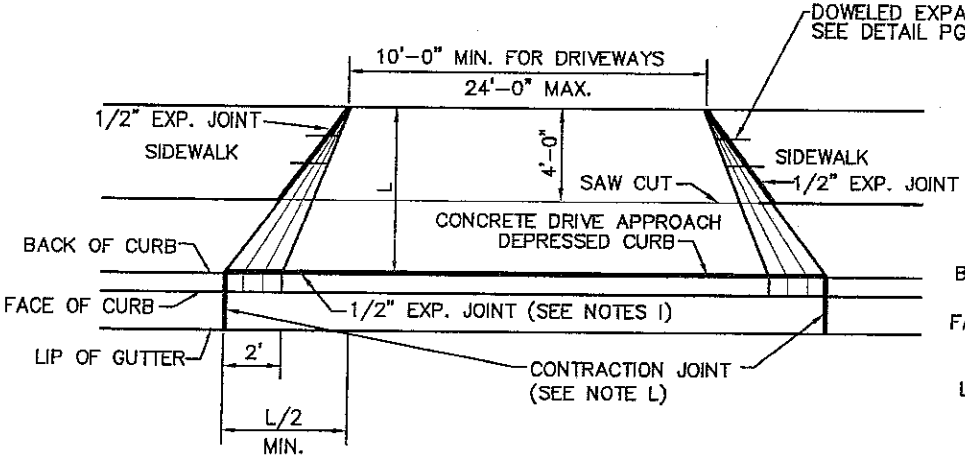
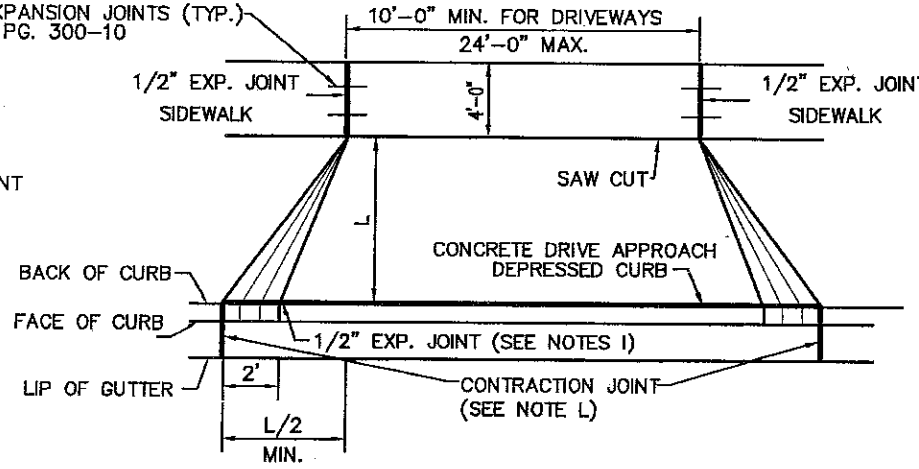






FOR TREE LAWNS OF LESS THAN 6'-0"



FOR TREE LAWNS OF 6'-0" OR MORE

NOTES

A. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST-IN-PLACE CONCRETE.

B. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY, TRANSVERSELY AND AT TAPERS.

C. EXPANSION MATERIAL SHALL BE 1/2" PREMOLDED.

D. 3" OF GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES IF DETERMINED NECESSARY BY THE COUNTY.

E. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

F. WHERE CURB AND GUTTER HAS NOT BEEN PROPERLY DROPPED AT DRIVE APPROACHES, THE CURB SHALL BE ENTIRELY REMOVED AND REPLACED BY THE CONTRACTOR OR OWNER AS DIRECTED BY THE COUNTY.

G. JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE COUNTY. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.

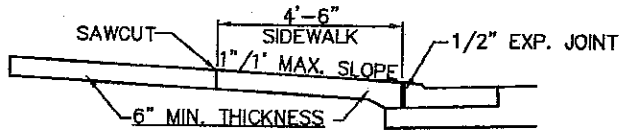
H. EXPANSION JOINT LOCATION MAYBE ALTERED WITH COUNTY APPROVAL.

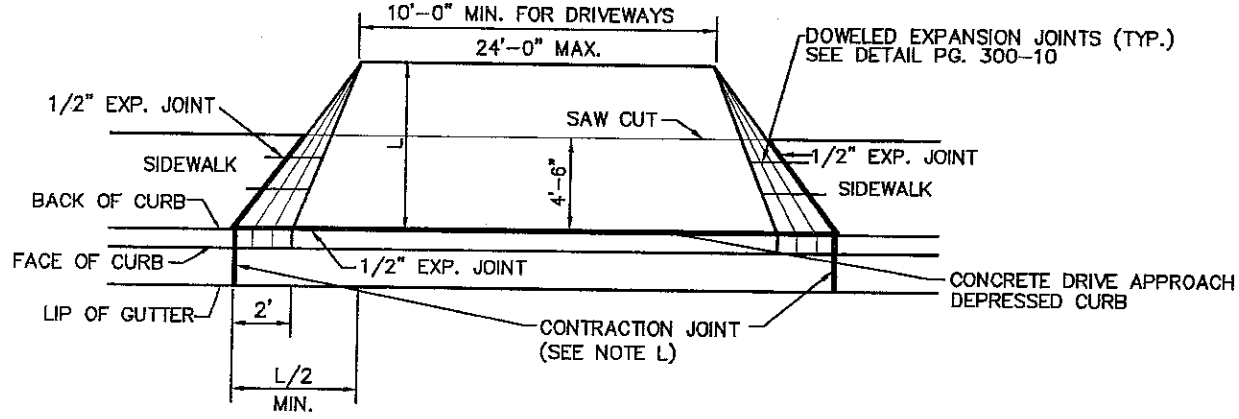
I. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600 LB/CY) CEMENT. PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

J. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.

K. IF CURB IS REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION, JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.

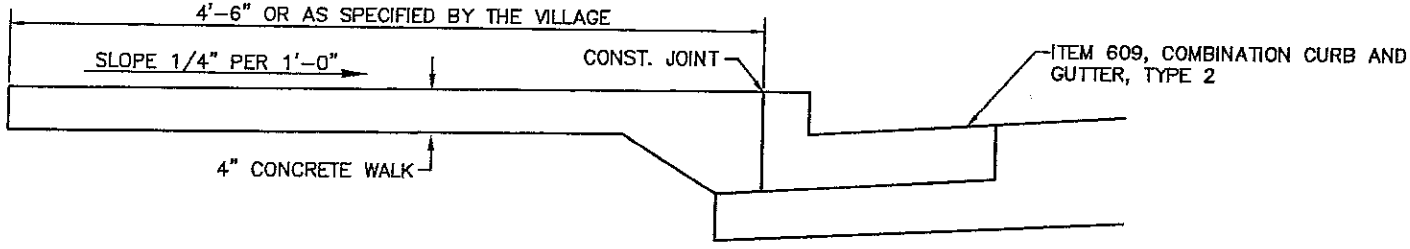
MERCER COUNTY CHOICE ONE ENGINEERING	# RESIDENTIAL DRIVE APPROACH	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300-6





DRIVE APRON WITH NO CURB LAWN

FOR DRIVEWAY NOTES SEE PAGE 300-6



CONCRETE SIDEWALK ABUTTING TYPE 2 CURB DETAIL

MERCER COUNTY

CHOICE ONE ENGINEERING

RESIDENTIAL DRIVE APPROACH AND CONCRETE SIDEWALK DETAIL WITH NO CURB LAWN

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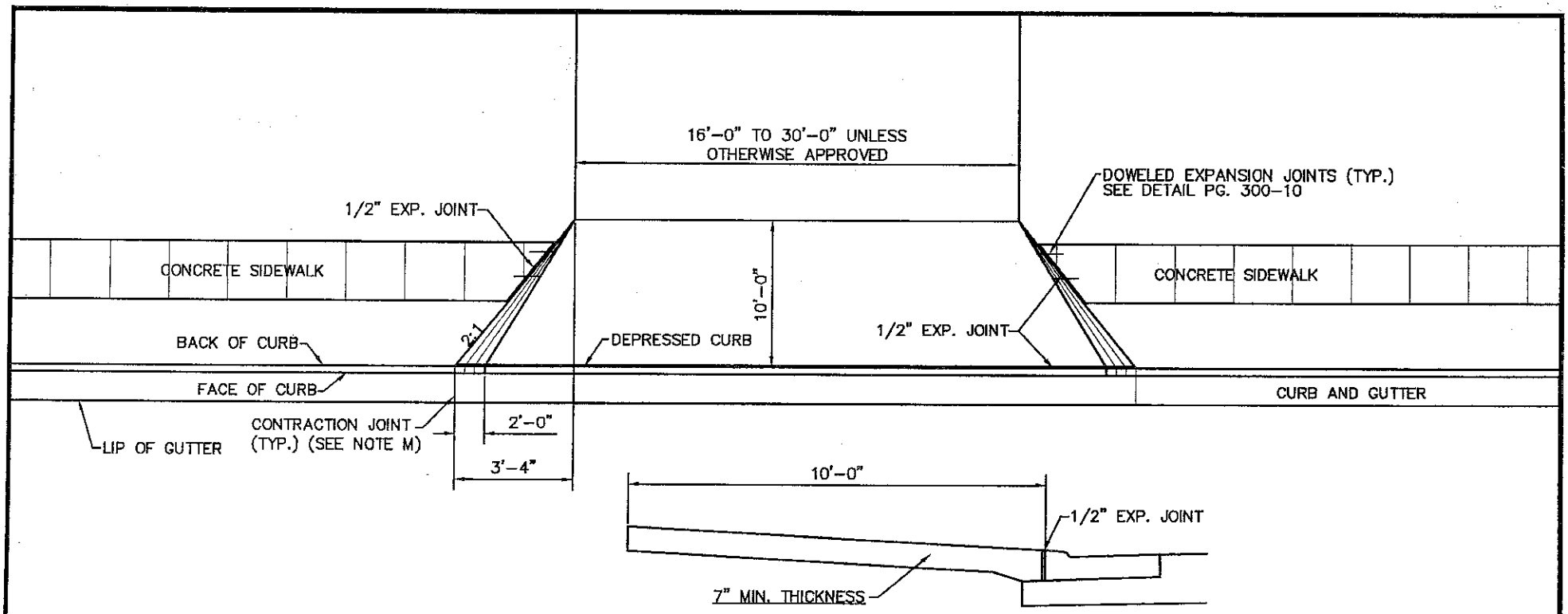


NOTES

A. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST IN PLACE CONCRETE.

B. DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICLY WITH CURB.

C. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY AND TRANSVERSELY WITH JOINTS AT TAPERS.

D. EXPANSION MATERIAL SHALL BE 1/2" PREMOLDED.

E. 3" OF AGGREGATE SHALL BE PLACED UNDER DRIVE APPROACHES IF DETERMINED NECESSARY BY THE COUNTY.

F. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

G. WHERE CURB AND GUTTER HAS NOT BEEN PROPERLY DROPPED AT DRIVE APPROACHES, THE CURB SHALL BE ENTIERLY REMOVED AND REPLACED BY THE CONTRACTOR OR OWNER AS DIRECTED BY THE COUNTY.

H. JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE COUNTY. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.

I. MINIMUM WIDTH FOR ONE–WAY TRAFFIC IS 16'–0". MINIMUM WIDTH FOR TWO–WAY TRAFFIC IS 25'–0". MAXIMUM WIDTH IS 30'–0" UNLESS OTHERWISE APPROVED BY THE COUNTY

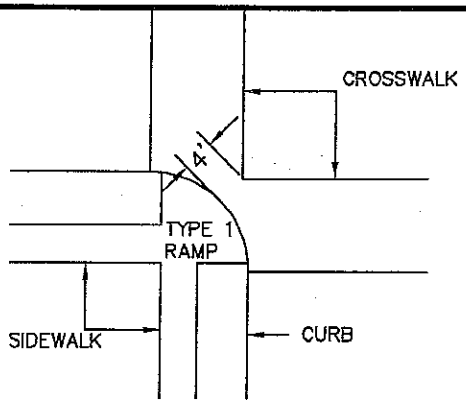
J. THIS STANDARD DRAWING IS FOR GUIDELINE PURPOSES. EACH INDIVIDUAL DRIVE WILL NEED TO BE DESIGNED AND SUBMITTED TO THE COUNTY FOR REVIEW AND APPROVAL.

K. CONCRETE SHALL BE ODOT CLASS C. (4000 PSI, 600 LB/CY CEMENT. PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

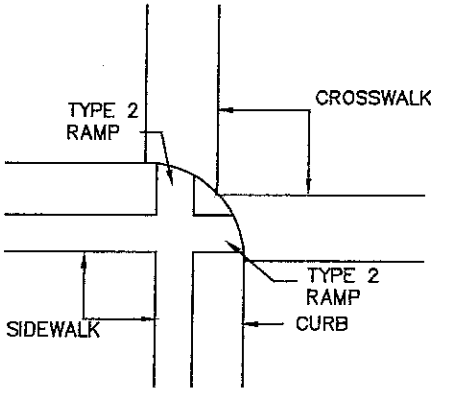
L. CONCRETE SHALL CONTAIN 6% ± 1% OF THE TOTAL AIR.

M. IF CURB IS REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION, JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.

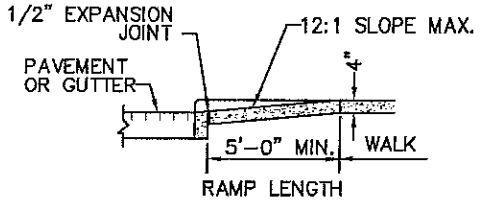
MERCER COUNTY CHOICE ONE EBING	# COMMERCIAL AND INDUSTRIAL DRIVE APPROACH	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300–8



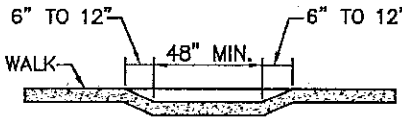
RAMP CONFIGURATION A



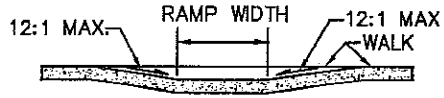
RAMP CONFIGURATION B



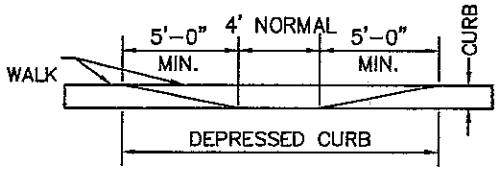
SECTION A-A



SECTION D-D



SECTION C-C



VIEW B-B

NOTES

A. COUNTY TO SPECIFY TYPE 1 OR TYPE 2 CURB RAMP.

B. ANY COMBINATION OF SIDE SLOPES ON OPPOSITE SIDES OF A RAMP MAY BE USED TO BEST FIT THE SITE CONDITIONS.

C. THE MINIMUM RAMP LENGTH IS 5' FROM BACK OF A 6" CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.

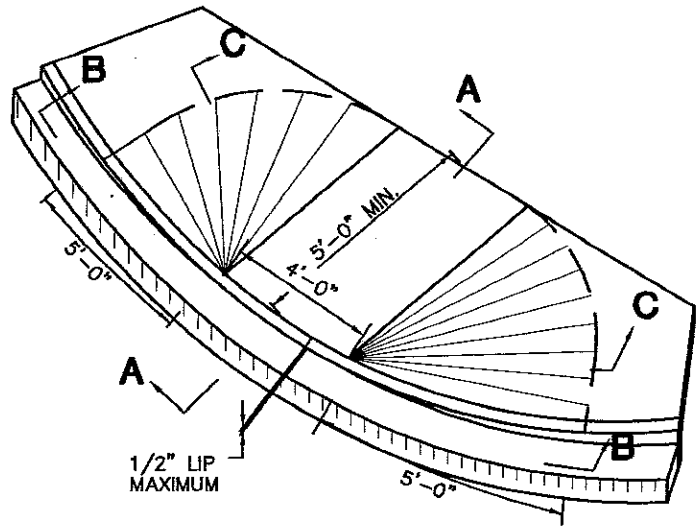
D. WALK THICKNESS IN THE RAMP SLOPES SHALL BE 4" MINIMUM OR THICKER AS NECESSARY TO MATCH ADJACENT WALK THICKNESS.

E. CURB RAMPS SHALL MEET AND BE FINISHED TO A.D.A. STANDARDS.

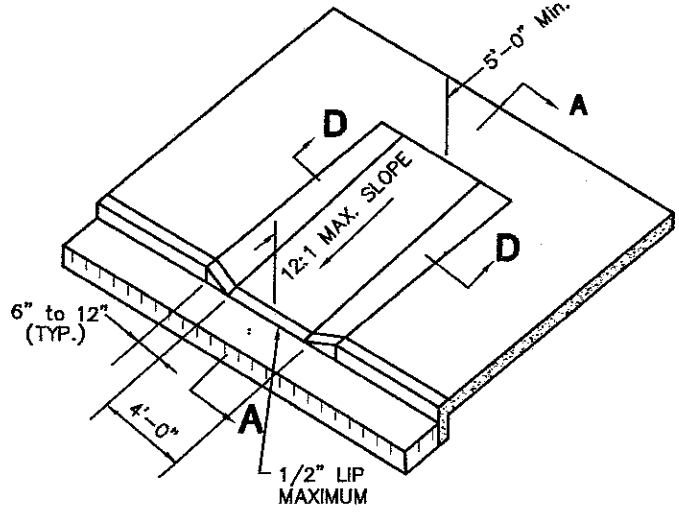
F. CURB RAMPS SHALL MEET THE REQUIREMENTS OF ODOT ITEM 608 UNLESS OTHERWISE SPECIFIED WITHIN.

G. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600 LB/CY CEMENT). PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

H. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.



TYPE 1 RAMP DETAIL



TYPE 2 RAMP DETAIL

MERCER COUNTY

CHOICE ONE ENGINEERING

CURB RAMPS

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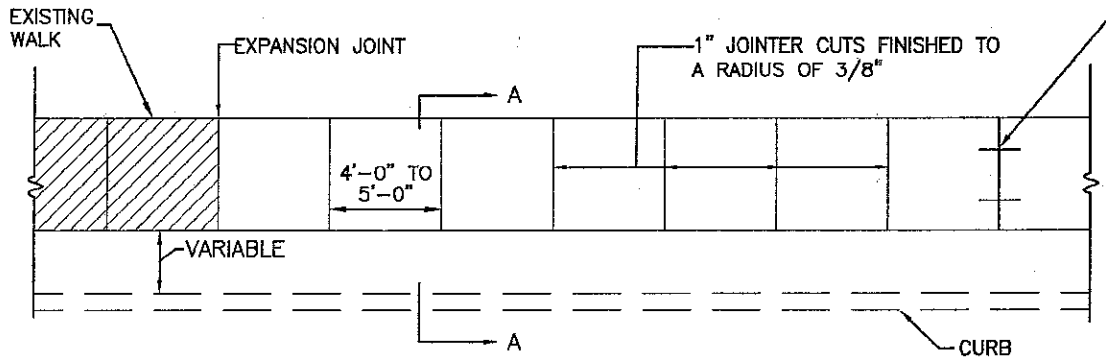
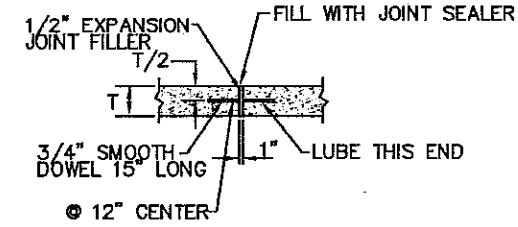
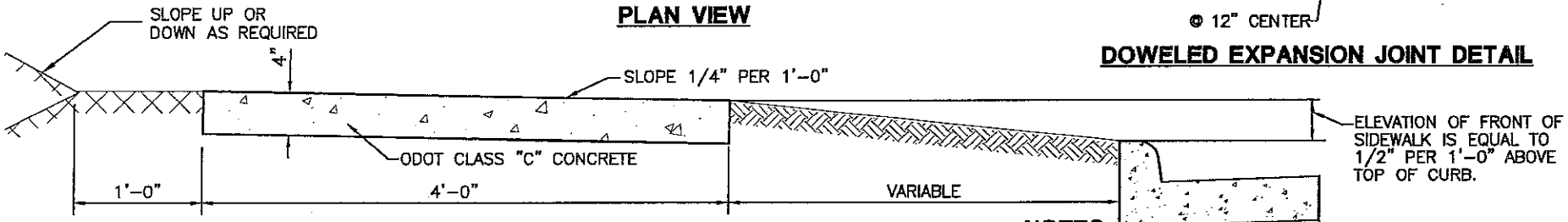


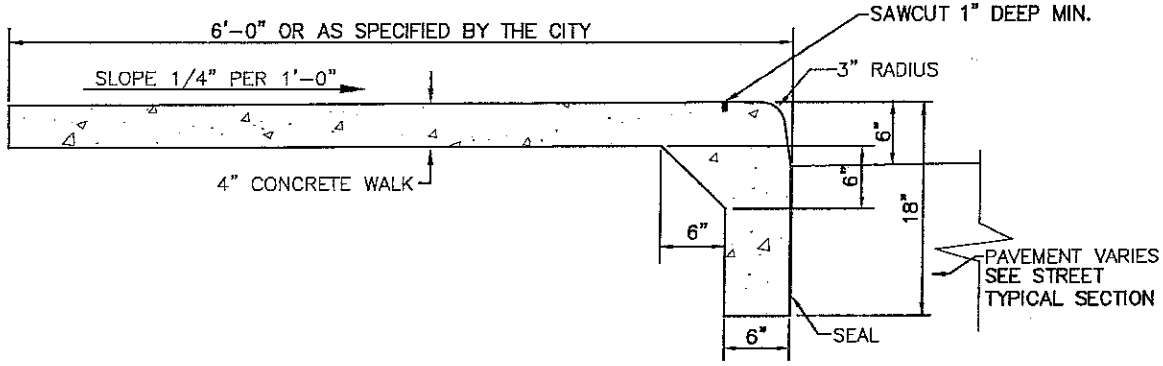
PLAN VIEW



DOWELED EXPANSION JOINT DETAIL



SECTION A-A



COMBINED CURB AND SIDEWALK DETAIL

NOTES

A. WALK TO BE POURED ON UNDISTURBED EARTH OR COMPACTED GRANULAR BEDDING.

B. PROVIDE BROOM FINISH TO ALL EXPOSED SURFACES.

C. CONCRETE SHALL CONFORM TO ODOT ITEM 499 CONCRETE. CONCRETE WORK SHALL CONFORM TO ODOT ITEM 608, UNLESS OTHERWISE SPECIFIED WITHIN.

D. PROVIDE EDGING AROUND ALL EXPOSED SURFACES.

E. USE WHITE PIGMENTED CURING COMPOUND IMMEDIATELY AFTER FINISHING SURFACES. ANY OTHER METHOD OR TYPE OF CURING COMPOUND MUST BE PREAPPROVED.

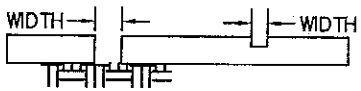
F. WHEN RENOVATING EXISTING STREETS, THE SIDEWALKS SHALL BE REPLACED TO CONFORM WITH THE COUNTY CONSTRUCTION STANDARDS AND DRAWINGS.

G. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600LB/CY CEMENT) PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

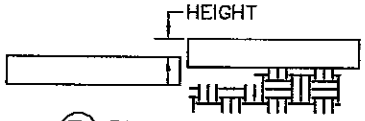
H. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.

MERCER COUNTY CHOICE ONE ENGINEERING	# CONCRETE SIDEWALK DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 600-10

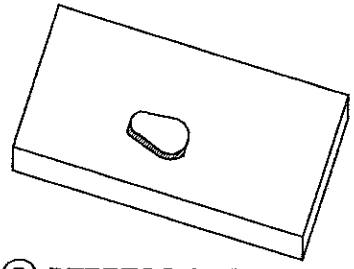
TYPES OF SIDEWALK DEFICIENCIES



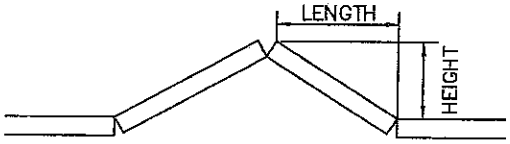
(A) OPENING
– MAXIMUM WIDTH



(B) STEP HUMP
–HEIGHT

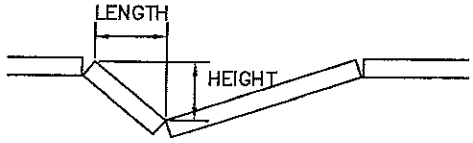


(C) DEPRESSIONS
– 2 S.F. PER BLOCK



(E) HUMP – MAXIMUM SLOPE – 1"/1'

SLOPE= HEIGHT / LENGTH



(E) SUNKEN SECTION – MAXIMUM SLOPE – 1"/1'

SIDEWALK DEFICIENCIES

A. ANY BLOCK HAVING A RANDOM CRACK OR CRACKS IN IT MORE THAN 1/4" WIDE OR IN EXCESS OF 5 L.F. IN ONE BLOCK.

B. ADJOINING BLOCKS OR PORTIONS THEREOF WHOSE EDGES DIFFER VERTICALLY BY MORE THAN 3/4".

C. BLOCKS HAVING DEPRESSIONS, REVERSE CROSS–SLOPE WHEN NOT PURPOSELY INTENDED TO BE THAT WAY (SLOPING AWAY FROM THE STREET) OR BELOW CURB GRADE SO AS TO IMPOUND MUD OR WATER.

D. BLOCKS HAVING A CROSS–SLOPE IN EXCESS OF 3/4" VERTICAL PER 1' HORIZONTAL EXCLUDING DRIVEWAYS.

E. BLOCKS THAT CAUSE AN ABRUPT CHANGE IN EXCESS OF 1" PER FOOT IN THE LONGITUDINAL GRADE OF THE SIDEWALK.

F. CELLAR DOORS OR OTHER COVERS THAT ARE NOT FLUSH WITH THE SIDEWALK, HAVE A SMOOTH SURFACE, OR ARE STRUCTURALLY UNSAFE.

G. GRATING THAT HAS OPENINGS MEASURING MORE THAN 3/4", PROJECT ABOVE THE SIDEWALK, OR ARE STRUCTURALLY UNSAFE.

PERMITS, INSPECTION AND WORK RULES

A. NO PERSON SHALL TEAR UP OR DIG INTO ANY PUBLIC RIGHT–OF–WAY OR STREET FOR THE PURPOSE OF CONSTRUCTING OR REPAIRING THE SIDEWALK, CURBING, OR GUTTERS THEREON OR FOR ANY OTHER PURPOSE, WITHOUT HAVING FIRST OBTAINED FROM THE CITY ADMINISTRATOR A PUBLIC RIGHT–OF–WAY OPENING PERMIT TO DO SO.

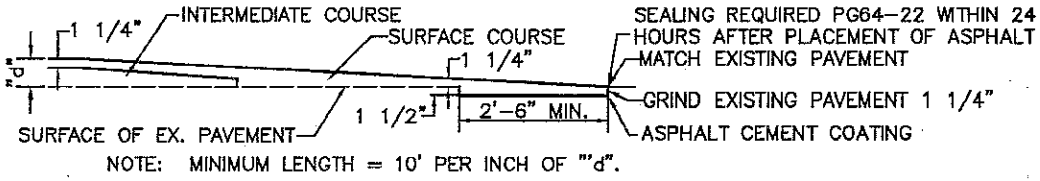
B. THE CONTRACTOR MUST CALL THE CITY FOR AN INSPECTION AT LEAST THREE WORKING HOURS BEFORE HE PLANS TO POUR THE CONCRETE. THE CONTRACTOR OR HIS FOREMAN MUST BE ON THE JOB WHEN THE INSPECTOR ARRIVES. IF, BECAUSE OF WEATHER CONDITIONS OR FOR SOME OTHER REASON, IT WILL NOT BE POSSIBLE TO HAVE A MAN ON THE JOB, THE CONTRACTOR IS REQUIRED TO CALL AND CANCEL THE INSPECTION.

C. THE CONTRACTOR IS CAUTIONED AGAINST ORDERING CONCRETE BEFORE THE INSPECTION IS MADE DUE TO POSSIBLE CORRECTION OF FORMS OR GRADE.

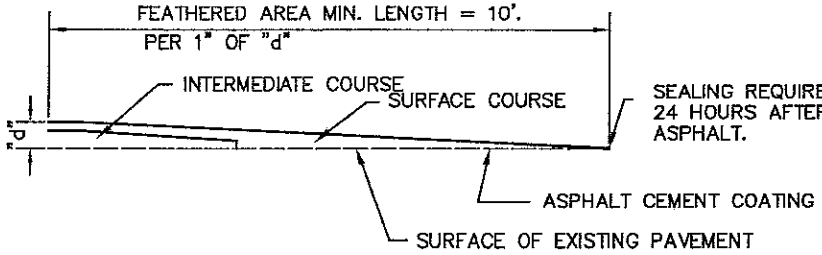
D. THE CONTRACTOR SHALL PROVIDE PROTECTION AND TRAFFIC CONTROL BARRICADES, LIGHTS, SIGNS, AND OTHER DEVICES AS HEREIN SPECIFIED TO PROVIDE WARNING AND PROTECTION FOR VEHICULAR TRAFFIC, PEDESTRIANS, AND THE WORK DURING THE REMOVAL, CONSTRUCTION, AND CURING OF SIDEWALK, CURB AND GUTTER, AND DRIVEWAY APRONS.

E. THE CONTRACTOR WILL BE RESPONSIBLE FOR AN IMMEDIATE REMOVAL AND CLEAN UP OF ALL EXCAVATED MATERIAL. NO EXCAVATED MATERIAL SHALL BE STORED ON THE PAVEMENT.

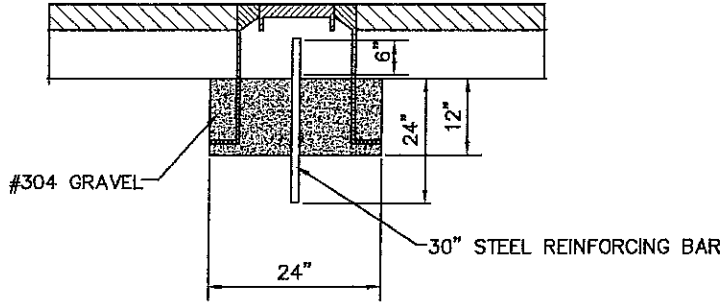
F. ALL SIDEWALK SHALL BE REPLACED ON STREET RECONSTRUCTION PROJECTS TO MEET THESE CONSTRUCTION STANDARDS AND DRAWINGS.



BUTT JOINT DETAIL



FEATHERING DETAIL



SURVEY MONUMENT DETAIL

NOTES

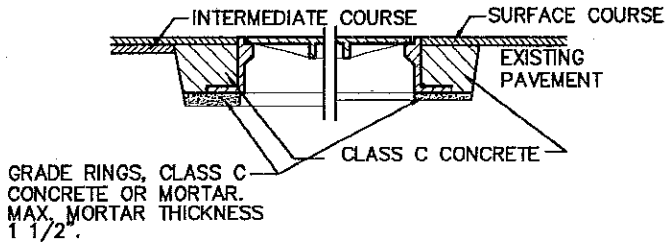
A. MONUMENT BOXES SHALL BE SET AT ALL STREET INTERSECTIONS, P.I.'S OF TANGENT LINES OF ALL CURVES, AND CENTER POINTS OF CUL-DE-SACS. IF A MONUMENT BOX CANNOT BE SET FOR A P.I. IN THE PAVEMENT AREA, BOXES MUST THEN BE SET ON THE P.C. AND P.T. OF A CURVE.

B. MONUMENT BOXES SHALL BE SET PRIOR TO THE LAYING OF ODOT ITEM 404 ASPHALT UNLESS OTHERWISE PREAPPROVED.

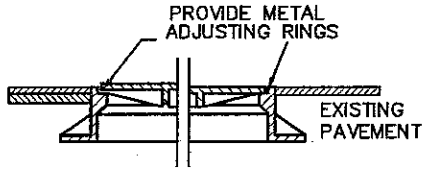
C. MONUMENT ASSEMBLIES SHALL BE EAST JORDAN 8360 OR EQUIVALENT.

D. MONUMENT BOXES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 604 UNLESS OTHERWISE SPECIFIED WITHIN.

MANHOLES ADJUSTED TO GRADE FOR OVERLAYS



USING CONCRETE OR MORTAR



USING METAL ADJUSTING RINGS

NOTES

METAL ADJUSTING RINGS SHALL:

A. ATTACH SECURELY TO THE EXISTING FRAME BY WELDING OR MECHANICAL DEVICES.

B. CONSIST EITHER OF CAST METAL HAVING AN INTEGRAL RIM AND SEAT, OR BE FABRICATED METAL WITH A STURDY CONNECTION BETWEEN THE SEAT AND RIM.

C. PROVIDE AN EVEN SEAT FOR THE MANHOLE COVER.

D. SHALL BE TYPE DESIGN ACCEPTABLE TO THE COUNTY.

E. ANY INSTALLATION UNACCEPTABLE TO THE COUNTY SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

MERCER COUNTY CHOICE ONE ENGINEERING	ASPHALT OVERLAY AND MONUMENT	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00-12

GENERAL

A. FAILURE TO COMPLY WITH THE CONSTRUCTION STANDARDS AND DRAWINGS AND DESIGN CRITERIA WILL REQUIRE REMOVAL AND REPLACEMENT IN ACCORDANCE WITH THESE STANDARDS.

B. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH ODOT SPECIFICATIONS, REVISION.

C. CONSTRUCTION IMPROVEMENTS AFFECTING THE EXISTING CONDITION, PERFORMANCE AND LIFE CYCLE OF COUNTY STREETS, ALLEYS, OR RIGHT-OF-WAYS SHALL BE RESTORED TO THE REQUIREMENTS AND SATISFACTION OF THE COUNTY ENGINEERING DEPARTMENT. ALL COUNTY INFRASTRUCTURE SHALL BE ADEQUATELY RESTORED ACCORDING TO APPLICABLE STANDARDS AND DETAILS.

D. ALL NEW SUBDIVISIONS AND DEVELOPMENTS SHALL BE PROVIDED WITH PUBLIC SIDEWALKS ON BOTH SIDES OF STREETS IN ACCORDANCE WITH COUNTY STANDARDS.

E. CURB CUTS FOR ALL NEW AND RECONSTRUCTED DRIVEWAYS SHALL CONFORM TO COUNTY STANDARDS. ALL NEW DRIVEWAY APPROACHES SHALL BE CONSTRUCTED OF CONCRETE AND SUBJECT TO ALL COUNTY REQUIREMENTS.

F. NO COUNTY STREET OR ALLEY SHALL BE CLOSED UNLESS THE COUNTY'S NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF A NON-EMERGENCY SITUATION. ADVANCED PUBLIC NOTIFICATION AND PUBLISHING SHALL BE A MINIMUM OF 24 HOURS.

G. TEMPORARY TURNAROUNDS MUST BE PROVIDED FOR ALL TEMPORARY DEAD END STREETS ALONG WITH NECESSARY SINAGE AND REFLECTIONS.

PAVEMENT REPLACEMENT

A. IMMEDIATELY AFTER PLACEMENT OF BACKFILL IN EXISTING STREETS, A TEMPORARY PAVEMENT SHALL BE INSTALLED AND THE STREET OPENED. TEMPORARY PAVEMENT SHALL CONSIST OF 8" OF COMPACTED ODOT SPECIFICATION 411 OR 307. THE SURFACE SHALL BE MAINTAINED FLUSH WITH THE EXISTING STREET.

B. PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT AND PERFORMED BY THE COUNTY. (MINIMUM PAVEMENT COMPOSITION, SEE PAGE 300-2 OR 300-3).

C. ANY SETTLEMENT OF A TRENCH CAUSING A DEPRESSION SHALL BE REFILLED AS REQUIRED BY THE COUNTY AT THE CONTRACTOR'S EXPENSE. THIS PROVISION APPLIES FOR A ONE-YEAR PERIOD AFTER WORK IS ACCEPTED BY THE COUNTY

D. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE COUNTY.

TRAFFIC CONTROL

A. THE CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL AT ALL TIMES WITH THE PROPER BARRICADES AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVISES. THESE CONTROL DEVICES SHALL BE IN PLACE PRIOR TO ANY WORK COMMENCING. CONTRACTOR WILL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL ITEMS.

B. TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE COUNTY.

CURB STAKING AND ROADWAY

A. LINE AND GRADE EVERY 25' ON A CONVENIENT OFFSET WITH TACKED HUBS.

PAVEMENT (ASPHALT)

A. THE CONTRACTOR SHALL PROVIDE THE COUNTY WITH A COPY OF THE NORMAL (MEDIUM TRAFFIC) ODOT 404 JOB MIX FORMULA FOR EACH PLANT THAT PROVIDES HOT MIXED ASPHALT TO THIS PROJECT. ALL MIXES SHALL FOLLOW ODOT JOB MIX FORMULA WITH THE EXCEPTION THAT THE BITUMEN CONTENT SHALL BE 0.2% HIGHER. SECTION 401.02 COMPOSITION OF THE CURRENT ODOT SPECIFICATIONS SHALL BE USED FOR ACCEPTANCE BASED ON THE INCREASED BITUMEN. A 448 OR 446 JOB MIX FORMULA WILL NOT BE ACCEPTABLE. RECYCLED ASPHALT SHALL NOT EXCEED 15% OF ANY 402 MIX PRODUCED.

B. THREE-WHEEL STEEL ROLLER SHALL BE USED FOR INITIAL BREAKDOWN ON ALL PROJECTS.

C. ALL WORK SHALL ADHERE TO ODOT'S LATEST REVISIONS AND TO THE CITY SPECIFICATIONS WHICHEVER IS MORE STRINGENT SHALL PREVAIL UNLESS OTHERWISE APPROVED.

D. PATCHED AREAS SHALL BE SEALED ON THE PERIMETER OF THE PATCH WITH ASPHALT CEMENT.

E. ALL UTILITY ADJUSTMENTS -- MANHOLE, WATER VALVES, ETC., -- SHALL BE RAISED TO FINISHED GRADE BEFORE THE FINAL ASPHALT COURSE IS LAID.

F. ASPHALT CEMENT SHALL BE USED ON THE LIP OF GUTTER PRIOR TO THE FINAL ASPHALT LIFT BEING PLACED. (SS-1 TACK OR [illegible] SEAL)

G. TACK COAT SHALL BE APPLIED PRIOR TO THE PLACEMENT OF THE FINAL LIFT OF ASPHALT IF THE EXISTING ASPHALT LIFT IS DIRTY OR AFTER TEN DAYS UNLESS OTHERWISE APPROVED. TEMPERATURE MUST BE 50°F OR HIGHER.

H. NO ASPHALT SHALL BE PLACED OVER EXCAVATED TRENCHES UNLESS TRENCHES HAVE BEEN COMPACTED AS PER COUNTY CONSTRUCTION STANDARDS & DRAWINGS PAGE 500-6.

I. NO ASPHALT SHALL BE LAID UNLESS THE COUNTY IS GIVEN PRIOR NOTICE AND THE AMBIENT TEMPERATURE IS 50°F OR GREATER UNLESS OTHERWISE APPROVED.

K. FINAL LIFT OF ASPHALT SHALL BE FINISHED TO 1/4" ABOVE THE LIP OF GUTTER.

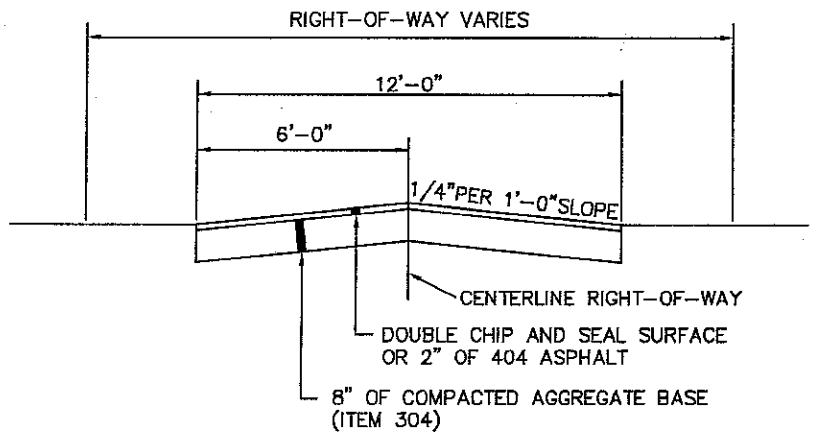
L. TEMPERATURES FOR BREAKDOWN ROLLING SHALL BE 260°F PLUS 15°F AND FOR FINAL ROLLING 175°F PLUS 15°F.

M. ASPHALT CEMENT SHALL BE USED ON ALL JOINTS AND FEATHERED SURFACES PRIOR TO PLACEMENT OF THE NEXT COURSE OF ASPHALT TO THE ABUTTING JOINT, UNLESS OTHERWISE APPROVED.

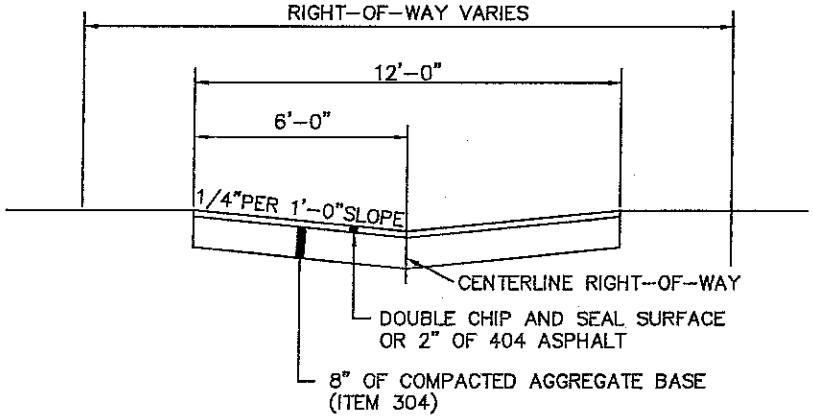
N. 325°F IS THE MAXIMUM TEMPERATURE ASPHALT MATERIAL IS TO BE MIXED.

O. ALL EDGES TO BE TRIMMED BACK AND SAW CUT TO SOLID MATERIAL AND BE STRAIGHT AND NEAT AS PER THE CITY'S INSTRUCTIONS.

P. ANY AREA FOUND DEFICIENT IN TOTAL ASPHALT DEPTH SHALL BE CORRECTED BY THE CONTRACTOR. MIN. OVERLAY DEPTH SHALL BE 3/4" FOR 404



TYPICAL CROWN



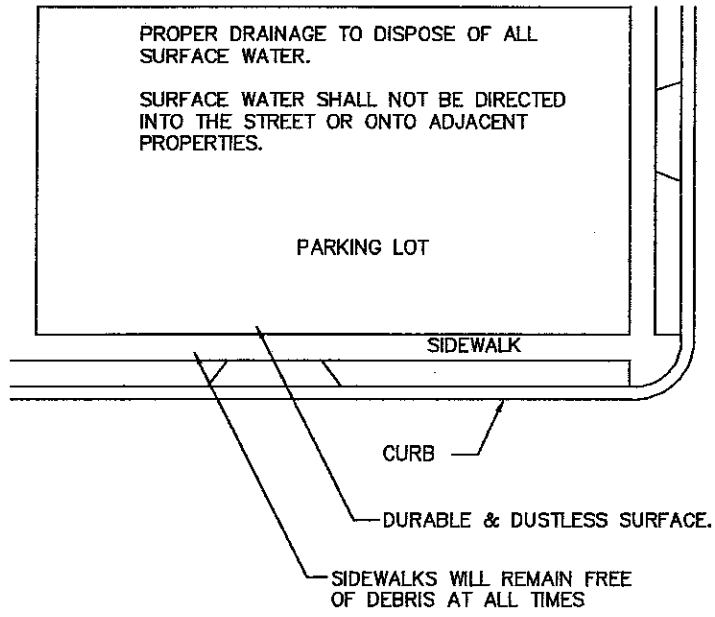
INVERTED CROWN

TYPICAL ALLEY CONSTRUCTION

A. MINIMUM STANDARD (UNLESS OTHERWISE APPROVED.)

B. FOR RENOVATION OF EXISTING ALLEYS ONLY. NO NEW ALLEY'S WILL BE APPROVED WITHIN THE COUNTY.

ADJACENT PARKING AREAS SHALL BE CONNECTED TO LIMIT THE NUMBER OF ACCESS DRIVES TO THE STREET.



PARKING LOT DETAIL

THE FOLLOWING ARE ACCEPTED LOT SURFACES (UNLESS OTHERWISE APPROVED).

A. DOUBLE CHIP AND SEAL, WITH APPROVAL.

B. ASPHALT CONCRETE ITEM 404.

C. CONCRETE

MERCER COUNTY

CHOICE ONE ENGINEERING

ALLEY AND PARKING LOT DETAIL

REVISIONS:

DATE APPROVED: JUNE 2000

PAGE No. 00–14

NOTES

A. THE COUNTY MUST BE NOTIFIED BEFORE ANYONE CAN PERFORM ANY WORK ON OR WITHIN A PUBLIC RIGHT-OF-WAY. (STREET, ALLEY, ETC.). NOTIFICATION IS REQUIRED FOR ANY TUNNEL, SIDEWALK, OPENING OR EXCAVATION UNDER OR IN THE RIGHT-OF-WAY PUBLIC GROUNDS.

B. THE NOTIFICATION WILL BE COMPLETED BY THE PERSON OR FIRM PLANNING THE WORK WITHIN THE RIGHT-OF-WAY. ALL APPROVALS MUST BE OBTAINED BEFORE ANY WORK IS STARTED. 72 WORKING HOUR LEAD TIME IS RECOMMENDED.

C. THE APPLICANT SHALL HAVE SUFFICIENT BARRICADES, WARNING SIGNS, AND LIGHTS DURING THE ENTIRE PERIOD THAT THE WORK IS BEING PERFORMED AND SHALL ADHERE TO APPLICABLE SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

D. ALL UTILITIES ARE REQUIRED TO OBTAIN APPROVAL.

E. THE EXISTING PAVEMENT SHALL BE NEATLY CUT PRIOR TO EXCAVATION. ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE JOB SITE. THE APPLICANT IS RESPONSIBLE FOR ALL PAVEMENT DAMAGED OUTSIDE THE TRENCH AREA.

F. BACKFILLING SHALL BE IN ACCORDANCE WITH COUNTY SPECIFICATIONS.

G. ALL EXCAVATIONS OR TRENCH EDGES UNDER OR WITHIN 5' OF PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS SHALL EITHER BE BACKFILLED WITH LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613, TYPE 1 ONLY OR BACKFILLED WITH ODOT 603 TYPE 1 OR TYPE 2 GRANULAR MATERIAL, COMPACTED IN 6" LAYERS. A DENSITY TEST OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAYBE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE COUNTY.

H. ALL EXCAVATION OR TRENCH EDGES NOT UNDER OR WITHIN 5' OF PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE COUNTY.

I. ALL DISTURBED AREAS MUST BE RETURNED TO AS GOOD OR BETTER CONDITION. ALL REPAIRS MUST MEET COUNTY SPECIFICATIONS. THE COUNTY MUST INSPECT AND APPROVE ALL REPAIRS.

J. COLD PATCH SHALL BE PLACED TO 1 1/2"+ THICKNESS OVER BACKFILLED TRENCH WITHIN ONE WORKING DAY AFTER THE BACKFILL HAS BEEN COMPACTED UNLESS THE ASPHALT PAVEMENT PLACED IMMEDIATELY AND REMOVED PRIOR TO PERMANENT PAVEMENT REPLACEMENT.

K. EFFORTS SHALL BE MADE TO MINIMIZE ANY DISTURBANCE TO TREES OR THIN ROOTS. EXTENSIVE EXCAVATION CAUSING DAMAGE TO TREES WILL RESULT IN THE REMOVAL AND REPLACEMENT OF, BY THE CONTRACTOR. THE REPLACEMENT SHALL BE AS PER THE COUNTY.

L. FOR CLOSURE OF ARTERIALS OR BUSY COLLECTORS THE MUNICIPALITY RESERVES THE OPPORTUNITY TO DIRECT CONTRACTOR TO TO CLOSE STREET DURING OFF-PEAK TRAFFIC HOURS. CLOSURE MAY OCCUR AT NIGHT OR ON WEEKENDS. CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL ASSOCIATED WITH ROAD CLOSURE.

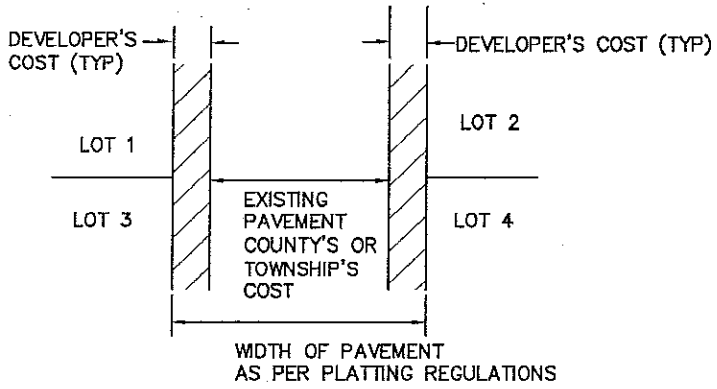
M. AN ASPHALT EMULSION, OR CRACK SEALANT, WITH ASPHALT GRADE SS-1 OR CSS-1 SHALL BE APPLIED TO THE PERIMETER OF ALL PAVEMENT CUTS AFTER RESTORATION IS COMPLETED.

N. PAVEMENT THICKNESS TO BE RESTORED SHALL BE ACCORDING TO COUNTY STANDARDS OR EQUAL TO THE EXISTING THICKNESS, WHICHEVER IS GREATER.

O. IN THE EVENT THAT AFTER NOTIFICATION FROM THE COUNTY, THE CONTRACTOR FAILS TO CORRECT PROBLEMS ASSOCIATED WITH POOR TRENCH MAINTENANCE, THE COUNTY RESERVES EXCLUSIVE RIGHT TO CORRECT TRENCH PROBLEMS AND BILL THE ASSOCIATED COSTS.

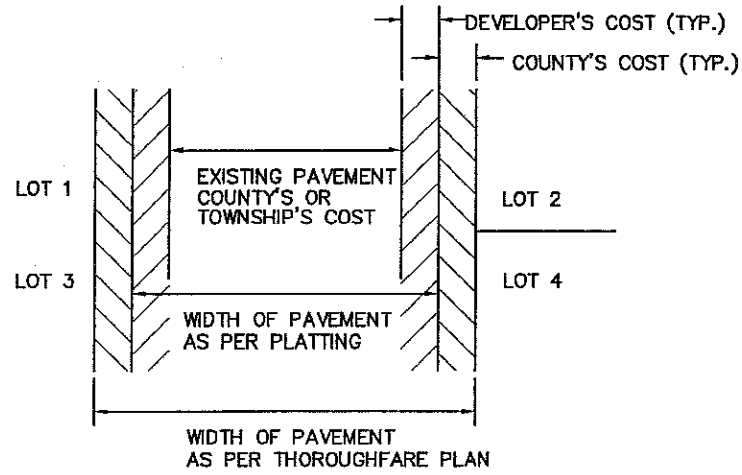
MERCER COUNTY CHOICE ONE ENGINEERING	# PUBLIC RIGHT-OF-WAY OPENING AND EXCAVATION	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300-15

EXAMPLE "A"



STREET IMPROVEMENTS FROM EXISTING STREET WIDTH TO PLATTING REGULATION WIDTH

EXAMPLE "B"



STREET IMPROVEMENTS FROM EXISTING STREET WIDTH TO THOROUGHFARE PLAN WIDTH

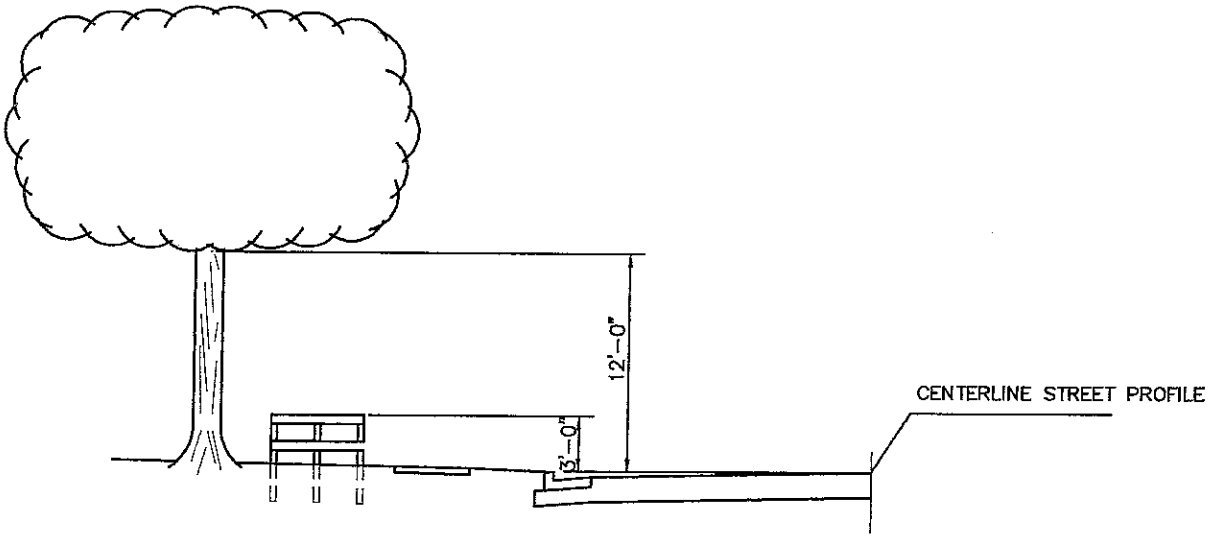
NOTES

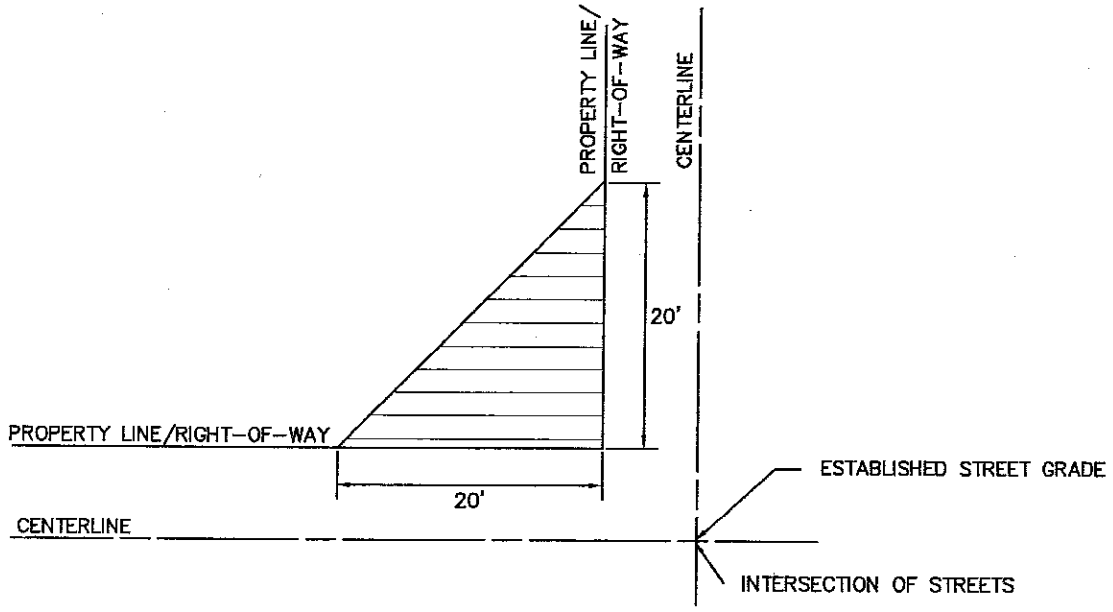
A. IF BOTH SIDES OF A STREET ARE INCLUDED IN THE SUBDIVISION, THE DEVELOPER PAYS THE TOTAL COST FOR ADDITIONAL WIDTH OF EXCAVATION, PAVEMENT, CURB AND SIDEWALK INCLUDING COST TO BRING THE STORM SEWER SYSTEM UP TO STANDARDS.

B. IF ONE SIDE OF THE SUBDIVISION ABUTS AN EXISTING STREET, THE DEVELOPER SHALL PAY FOR THE TOTAL COST OF ONE SIDE FOR ADDITIONAL WIDTH OF EXCAVATION, PAVEMENT, CURB AND SIDEWALK INCLUDING COST TO BRING THE STORM SEWER SYSTEM UP TO STANDARDS.

C. THE COUNTY PAYS CONSTRUCTION COST ON EXISTING STREET WIDTH AND ANY OVERSIZING TO MEET THOROUGHFARE PLAN.

MERCER COUNTY CHOICE ONE ENGINEERING	STREET IMPROVEMENT CONDITIONS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–16



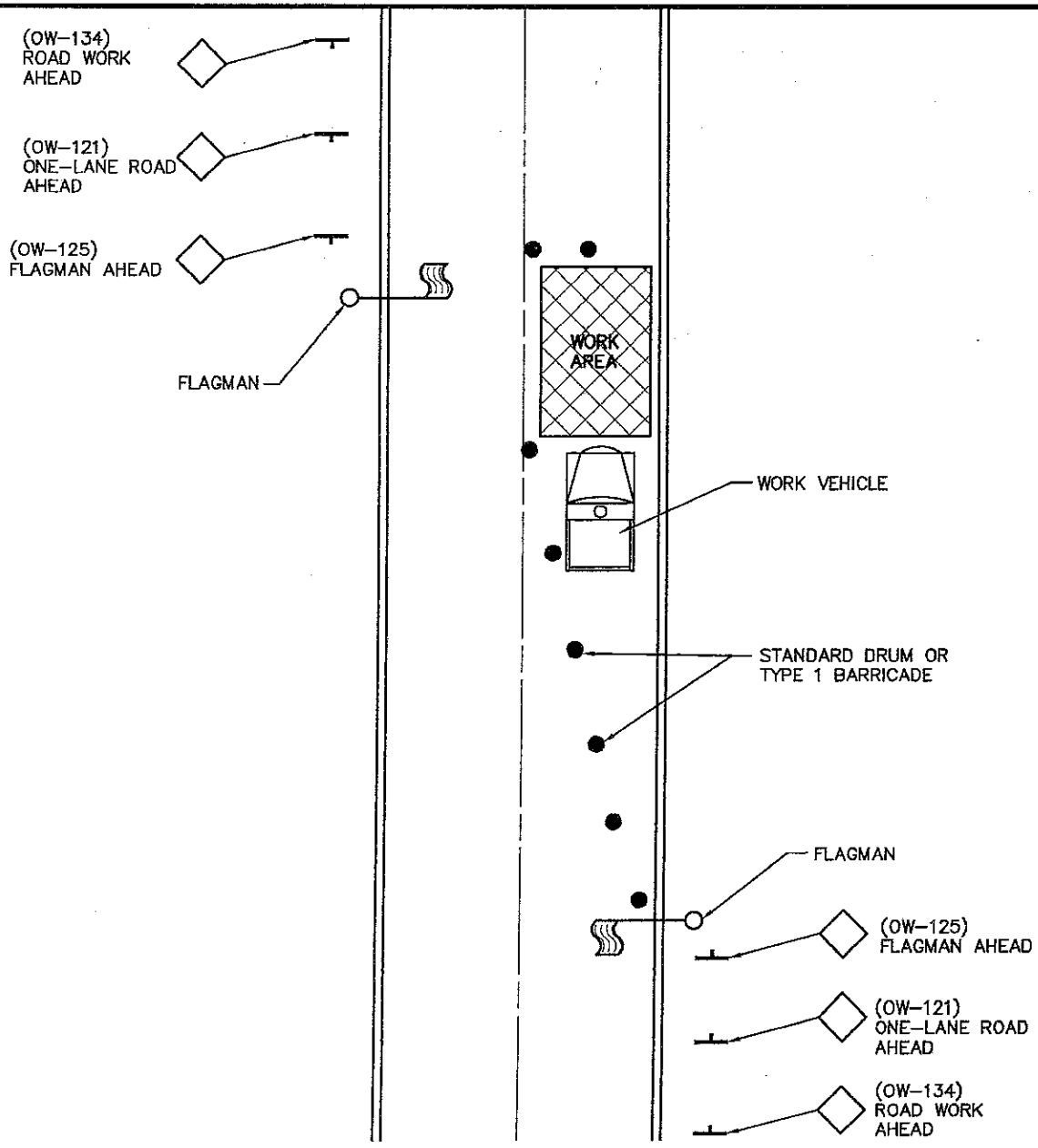


VISION CLEARANCE EXHIBIT

NOTES

THERE SHALL NOT BE ANYTHING ABOVE 3' OR BELOW 12' OF THE ESTABLISHED STREET GRADE IN THE TRIANGULAR SHADED AREA.

MERCER COUNTY CHOICE ONE ENGINEERING	# VISION CLEARANCE ON CORNER LOTS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300-17



NOTES

A. THE POLICE AND FIRE DEPARTMENTS SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF ANY CONSTRUCTION. NO STREET SHALL BE CLOSED WITHOUT THE APPROVAL OF THE COUNTY.

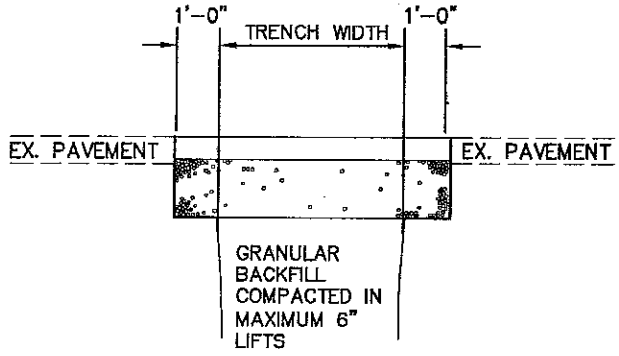
B. IF THE WORK IS TO COVER THE ENTIRE WIDTH OF THE STREET, ONE HALF OF THE STREET SHALL BE MAINTAINED FOR TRAFFIC WHILE ONE HALF OF THE STREET IS REPAIRED.

C. BARRICADE DISTANCE AND SEPARATION OF WARNING TO BE SPACED AS PER JOB SITE ACCORDING TO THE COUNTY.

D. IF BARRICADES ARE TO BE LEFT UP OVERNIGHT, WARNING LIGHTS (FLASHERS) ARE TO BE USED.

E. ALL STREET CONTROL DEVICES APPLICABLE TO DIFFERENT WIDTH STREETS, TYPE OF CONSTRUCTION, ETC., SHALL CONFORM TO THE LATEST REVISION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, UNLESS OTHERWISE APPROVED BY THE COUNTY AND SHALL BE IN PLACE AND PROPERLY DISPLAYED PRIOR TO THE COMMENCEMENT OF ANY WORK.

MERCER COUNTY CHOICE ONE ENGINEERING	# TRAFFIC CONTROL DEVICES # STATIONARY OPERATIONS IN ONE LANE	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–18



TYPICAL PAVEMENT RESTORATION DETAIL

TYPICAL PAVEMENT RESTORATION NOTES

MINIMUM AGGREGATE PAVEMENT REPLACEMENT
2" OF ODOT #67 ON
12" OF ODOT ITEM 304, IN LIFTS OF 3" MAXIMUM

MINIMUM ASPHALT PAVEMENT REPLACEMENT
PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT COMPOSITION. (MINIMUM PAVEMENT COMPOSITION SEE PAGE 300-2 UTILIZING APPROPRIATE STREET CLASSIFICATION).

SOIL BORINGS SHALL BE CAPPED WITH A MINIMUM OF 9" OF ODOT CLASS C CONCRETE.

MERCER COUNTY CHOICE ONE ENGINEERING	TYPICAL PAVEMENT RESTORATION DETAILS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300-19

TRAFFIC CONTROL DEVICE NOTES

A. ALL TRAFFIC CONTROL DEVICES SHALL BE PER THE LATEST REVISION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND APPROVED BY THE COUNTY BEFORE INSTALLATION.

B. ALL SIGN POST SHALL BE STANDARD STEEL POST UNLESS OTHERWISE APPROVED BY THE COUNTY.

C. ALL STREET NAME SIGNS SHALL BE WHITE IN COLOR WITH BLACK LETTERING UNLESS OTHERWISE APPROVED BY THE COUNTY.

MERCER COUNTY CHOICE ONE ENGINEERING	# TRAFFIC CONTROL DEVICES	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 500–1

SEEDING

A. ALL AREAS DESIGNATED FOR SEEDING SHALL HAVE A MINIMUM OF 6" OF TOPSOIL OVER THE ENTIRE AREAS. THE AREA SHALL BE RAKED, ROLLED, AND DRESSED READY FOR SEEDING. NO STONE OVER 1" IN SIZE PERMITTED.

TREE PLANTING IN PUBLIC RIGHT-OF-WAY

A. ALL TREES PLANTED IN THE PUBLIC RIGHT-OF-WAY SHALL HAVE THEIR TYPE AND LOCATION APPROVED BY THE COUNTY ENGINEERING DEPARTMENT PRIOR TO INSTALLATION.

DRAINS

A. ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE REPAIRED AND PROVIDED WITH UNOBSTRUCTED OUTLETS AS APPROVED AND DIRECTED BY THE COUNTY AND MARKED ON THE RECORD DRAWINGS.

CONNECTIONS TO EXISTING PIPE

A. WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

UTILITY SEPARATION

A. ANY UNDERGROUND UTILITIES SUCH AS GAS, ELECTRIC, CABLE TV, TELEPHONE, ETC., SHALL HAVE 10' SEPARATION FROM ANY COUNTY UTILITY UNLESS OTHERWISE APPROVED.

UTILITIES

A. THE MAXIMUM LENGTH OF ANY UTILITY TRENCH TO BE OPEN AT ANY TIME SHALL BE 250' UNLESS OTHERWISE APPROVED.

COMPACTION METHODS

A. FLOODING SHALL NOT BE PERMITTED.

B. MECHANICAL DEVICES, HAND DEVICES, VIBRATING PLATES OR OTHER EQUIPMENT APPROVED BY THE COUNTY IS ACCEPTABLE 1' ABOVE PIPE IN UNIFORM LIFTS OF 12" (LOOSE DEPTH) OF EXISTING NATIVE MATERIAL AND 6" OF GRANULAR BACKFILL. THE HEIGHT OF LIFTS WILL DEPEND UPON THE TYPE OF MECHANICAL EQUIPMENT BEING USED. THE HEIGHT WILL BE 6" FOR HAND OPERATED TOOLS AND UP TO 12" ON EQUIPMENT MOUNTED TOOLS. THE COMPACTION EQUIPMENT SHALL BE CAPABLE OF COMPACTING THE MATERIAL UNDER THE HAUNCH OF THE PIPE.

C. JETTING IS APPROVED FOR ODOT 304, TYPE 2 GRANULAR MATERIAL ONLY AND IF A STORM DRAIN IS AVAILABLE AS A DRAINAGE OUTLET FOR REMOVAL OF EXCESS WATER. A 4' MAXIMUM LIFT SHALL BE ADHERED TO. SATISFACTORY DRAINAGE SHALL BE PROVIDED BY THE USE OF DRAINAGE DITCHES, PUMPS OR OTHER EQUIPMENT. ALL WATER MUST BE METERED FOR COMPACTION METHOD.

D. DENSITY FOR THE ABOVE METHODS SHALL BE NO LESS THAN THAT OF THE SURROUNDING GROUND UNLESS OTHERWISE SPECIFIED.

DISPOSAL OF SURPLUS MATERIAL

A. THE COUNTY MAY AT THEIR DISCRETION REQUIRE THAT SURPLUS MATERIAL BE DEPOSITED AT A LOCATION DESIGNATED WITHIN A THREE-MILE RADIUS OF THE WORK SITE.

TYPICAL NOTES - ALL SUBDIVISION CONSTRUCTION DRAWINGS

A. ALL CONSTRUCTION METHODS AND MATERIALS SHALL COMPLY WITH THE COUNTY ENGINEERING STANDARDS OR ODOT WHICHEVER IS MORE RESTRICTIVE.

B. ALL COMPACTION SHALL MEET THE COUNTY REQUIREMENTS. IF TESTING OF COMPACTED AREAS IS REQUESTED BY THE COUNTY, SAID TESTING SHALL BE PERFORMED AT THE EXPENSE OF THE DEVELOPER.

C. THE COUNTY WILL LOCATE AREAS UTILIZING PROOFROLLING TECHNIQUES TO DETERMINE NEED OF UNDERCUTTING UNLESS THE DEVELOPER CHOOSES TO HAVE AT HIS EXPENSE AN INDEPENDENT APPROVED TESTING COMPANY TO DETERMINE UNSUITABLE MATERIAL AREAS THAT NEED UNDERCUTTING.

D. ALL EMBANKMENT/AND SUBGRADE AREAS SHALL BE COMPACTED TO A MINIMUM OF 95% OF ASTM D698 STANDARD PROCTOR CURVE AND TESTED TO REPRESENT A DEPTH OF 12" UNLESS OTHERWISE SPECIFIED BY THE COUNTY.

E. ALL UNPAVED AREAS WITHIN THE STREET RIGHT-OF-WAY SHALL BE SEEDED WITHIN 48 HOURS AFTER THE CURB IS BACKFILLED. STAKED STRAW BALES MAY BE REQUIRED IN ADDITION TO SEEDING TO CONTROL EROSION IF REQUESTED BY THE COUNTY.

F. STORM WATER POLLUTION PREVENTION SHOULD BE A HIGH PRIORITY ON ALL CONSTRUCTION PROJECTS. ON ALL PROJECTS WHICH DISTURB AT LEAST 5 ACRES OF SOIL, A NPDES PERMIT IS REQUIRED FROM OEPA AND A COPY OF THE PERMIT MUST BE ON FILE AT THE COUNTY OFFICE BEFORE CONSTRUCTION BEGINS.

LOW STRENGTH MORTAR BACKFILL

A. IN SITUATIONS WHERE UTILITIES CROSS HEAVILY TRAVELED STREETS OR IT MAY BE DIFFICULT TO GET ADEQUATE COMPACTION ON GRANULAR MATERIAL, LOW STRENGTH MORTAR BACKFILL WILL BE REQUIRED PER ODOT ITEM 613 TYPE 1 ONLY. THE COUNTY MAY REQUIRE THIS TYPE OF BACKFILL AT THEIR DISCRETION WITH THE COST BEING BORE BY THE CONTRACTOR. COUNTY WILL REQUIRE MATERIAL CERTIFICATION.

BORING/JACKING

A. MATERIALS.

CASING PIPE SHALL BE WELDED STEEL PIPE CONFORMING TO AWWA C-202.

B. INSTALLATION (CASING PIPE).

1. FURNISH PROCEDURE METHODS TO THE COUNTY FOR APPROVAL.

2. ALL METHODS AND PROCEDURES SHALL BE APPROVED BY THE COUNTY PRIOR TO CONSTRUCTION.

3. ADEQUATELY SUPPORT ALL TRENCHES AND BORING/JACKING PITS.

4. INSTALL TO LINE AND GRADE SHOWN.

C. INSTALLATION (CARRIER PIPE).

1. PLACE CONDUITS IN CASING PIPE TO SAME RELATIVE POSITIONS AS ADJACENT DUCT BY USE OF SPACERS.

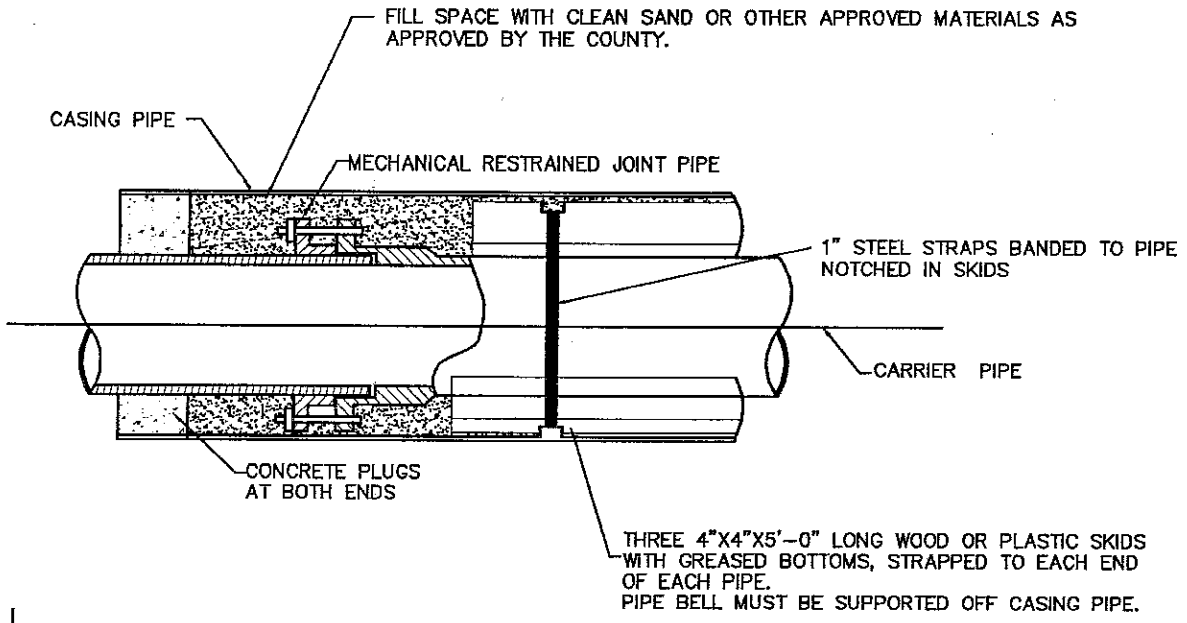
2. FILL THE SPACE BETWEEN CONDUITS INSIDE THE CASING PIPE WITH CLEAN SAND OR OTHER APPROVED MATERIALS AS APPROVED BY THE COUNTY.

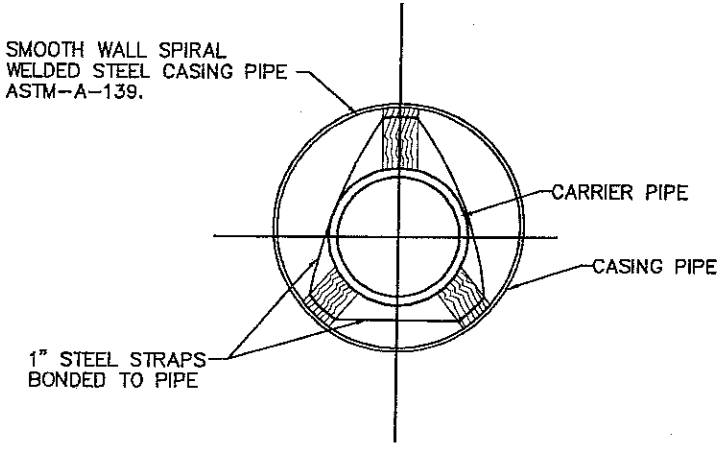
STEEL CASING PIPE

A. STEEL PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.

B. JOINTS BETWEEN THE SECTIONS OF PIPE SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.

DIAMETER NOMINAL (INCHES)	NOMINAL THICKNESS (INCHES)
10 AND UNDER	0.188
12 & 14	0.250
16	0.281
18	0.312
20 & 22	0.344
24	0.375
26	0.406
28	0.438
30	0.469
32	0.500
34 & 36	0.532
38	0.562
40	0.594
42	0.625
44 & 46	0.657
48	0.688
50	0.719
52	0.750
54	0.781
56 & 58	0.812
60	0.844
62	0.875
64	0.906
66 & 68	0.938
70	0.969
72	1.000





MERCER COUNTY

CHOICE ONE ENGINEERING

CASING PIPE DETAIL

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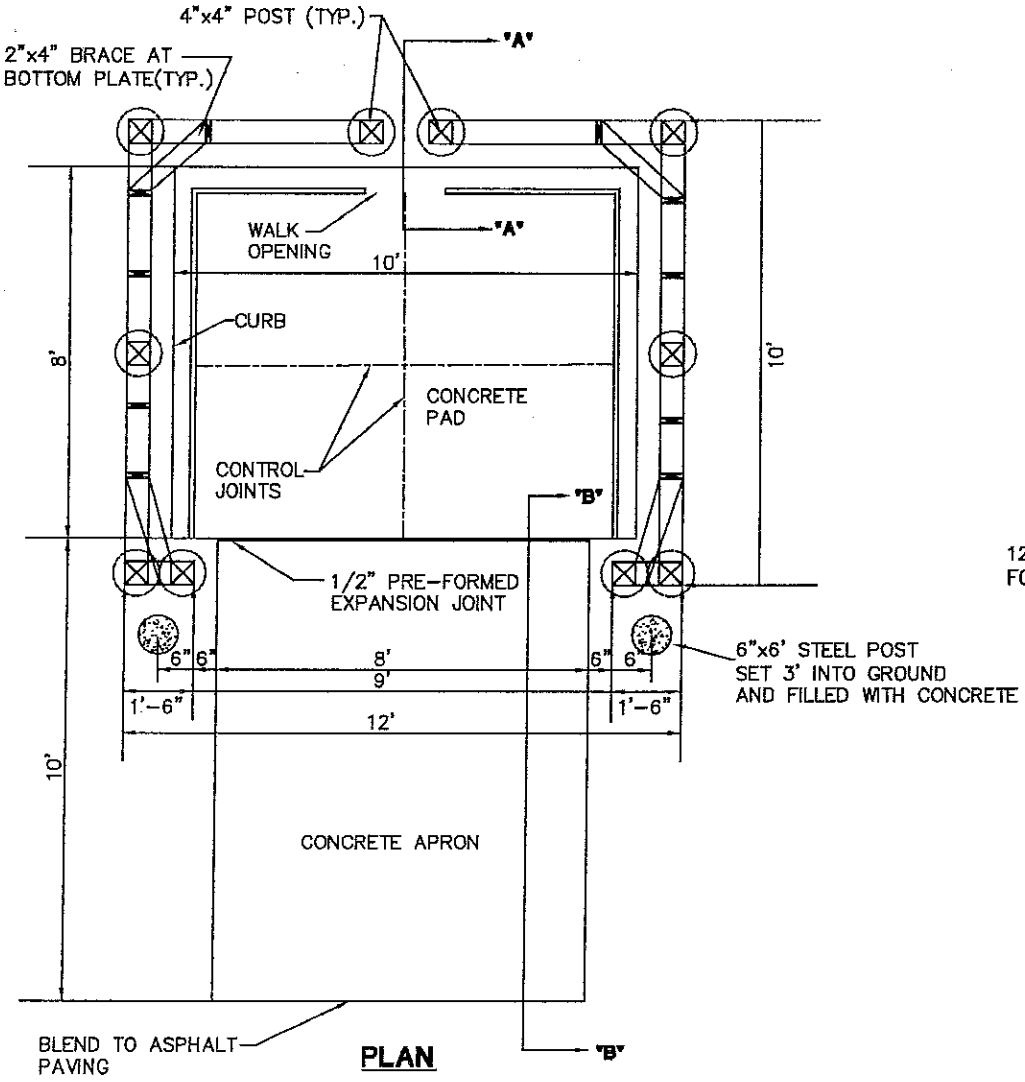
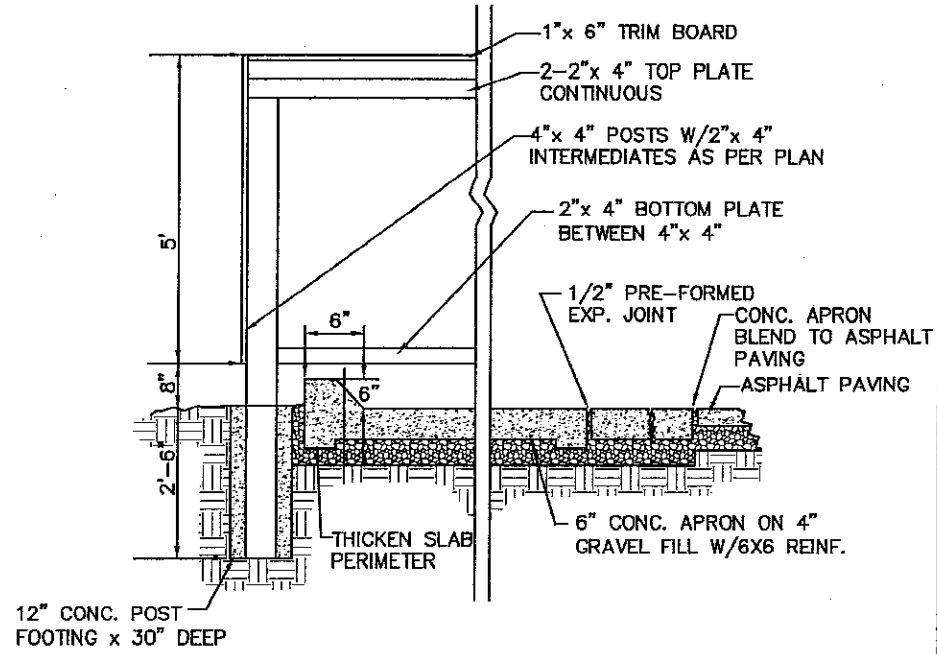


PLAN



"A-A" **"B-B"**

SECTION

TRASH ENCLOSURE

NOTES:

(1) TRASH CONTAINER TO BE SIZED IN ACCORDANCE WITH DEVELOPMENT REQUIREMENTS.

(2) CONTAINER SHALL BE SECURED

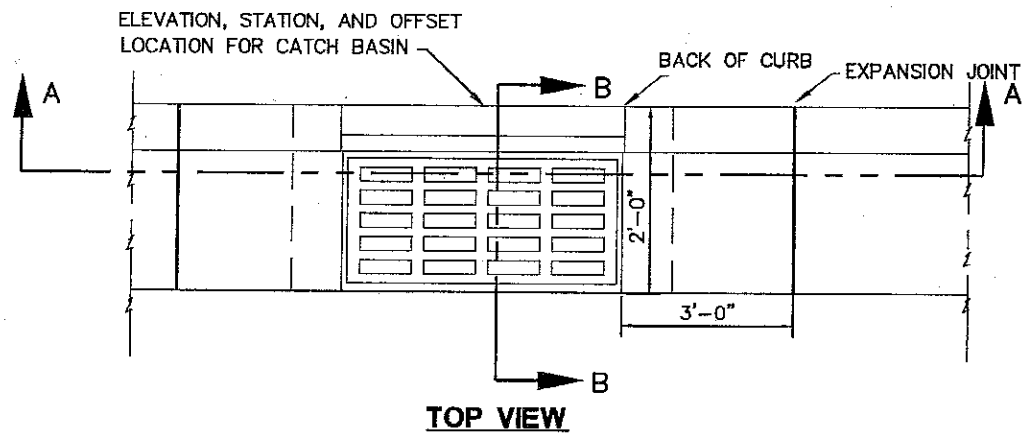
(3) PLANS TO BE COMPLIED WITH UNLESS OTHERWISE APPROVED.

(4) ALL DUMPSTERS SHALL BE PROVIDED WITH A DUMPSTER PAD AND A MINIMUM THREE-SIDED 6 FOOT HIGH ENCLOSURE IN WHICH RESTRICTS THE VIEW OF THE DUMPSTER OR DUMPSTERS CONTAINER ON-SITE.

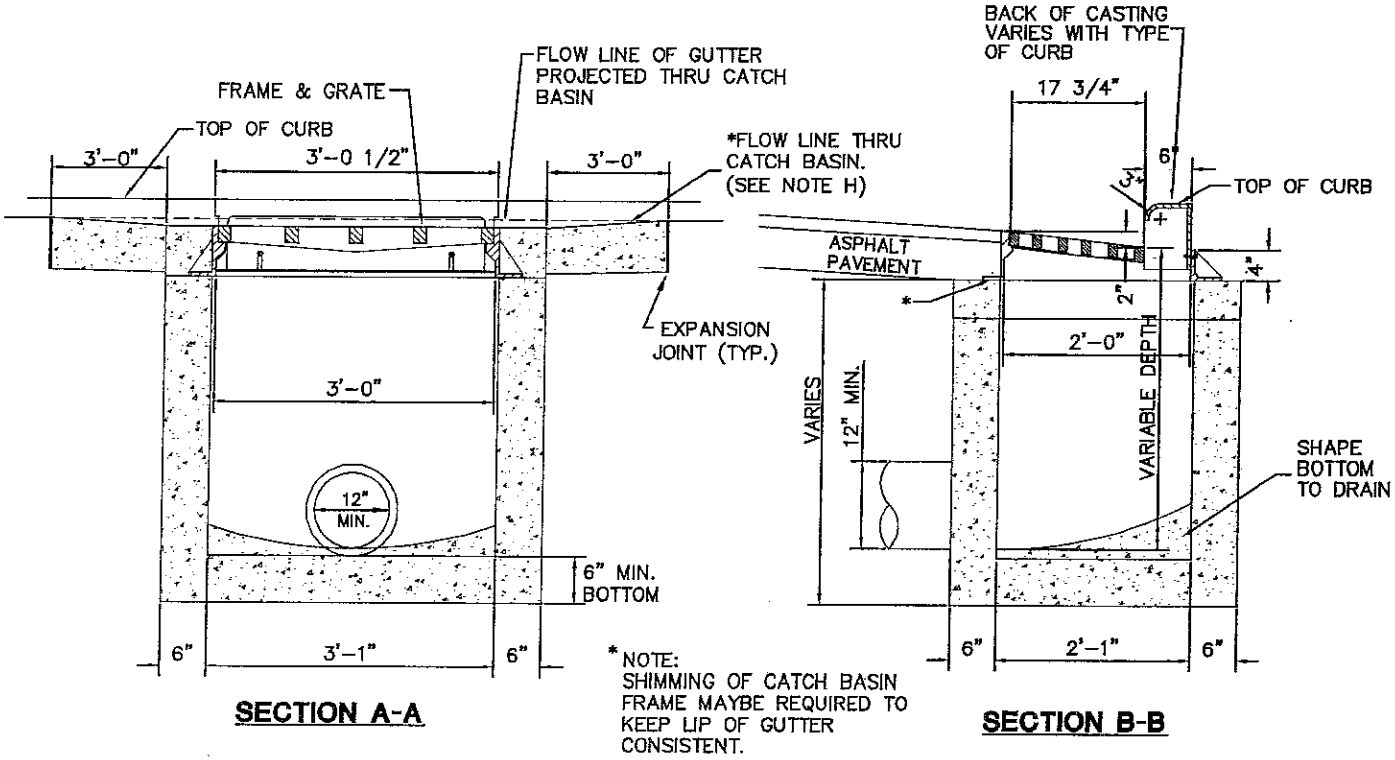
(5) SEE ZONING CODE FOR PROPER SET BACKS FROM PROPERTY LINE.

MERCER COUNTY CHOICE ONE ENGINEERING	# SANITATION ENCLOSURE DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 500-5

600 - STORM DRAINAGE



TOP VIEW



SECTION A-A

SECTION B-B

*NOTE: SHIMMING OF CATCH BASIN FRAME MAYBE REQUIRED TO KEEP LIP OF GUTTER CONSISTENT.

NOTES

A. CASTING SHALL BE EAST JORDAN 7030 OR NEENAH R-3246 OR EQUIVALENT.

B. FOR TYPE 2 COMBINATION CURB AND GUTTER. THE BACK SHALL BE EAST JORDAN TYPE T4 OR NEENAH (3" RADIUS) (R-3246-I).

C. FOR TYPE 1 COMBINATION ROLL CURB AND GUTTER THE BACK SHALL BE EAST JORDAN TYPE T2 OR NEENAH (MOUNTABLE CURB) (R-3246-E).

D. CATCH BASIN IN DRIVE APPROACHES (TO BE AVOIDED, IF POSSIBLE) THE BACKS SHALL BE EAST JORDAN TYPE T3 OR NEENAH (R-3246-A) WITH CURB PLATE).

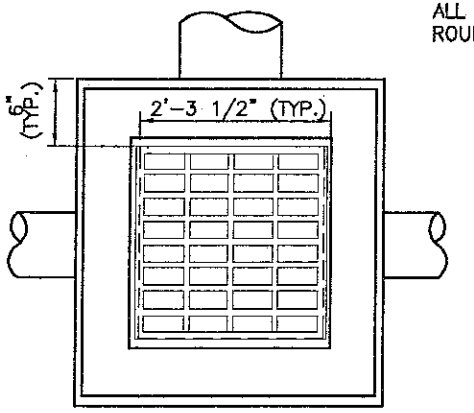
E. STANDARD GRATE SHALL BE EAST JORDAN TYPE M2, NEENAH TYPE C, OR EQUIVALENT. ALL BAR EDGES TO BE ROUNDED 1/8" RADIUS.

F. CONCRETE, CAST-IN-PLACE, TO BE CLASS C. PRECAST CONSTRUCTION PERMITTED AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6±+2% AIR VOID CONTENT IN THE HARDENED CONCRETE. KNOCKOUTS ARE REQUIRED IN PRECAST CONSTRUCTION. PRECAST WALLS SHALL HAVE A SUFFICIENT AMOUNT OF REINFORCEMENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

G. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO CATCH BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" ONLY AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.

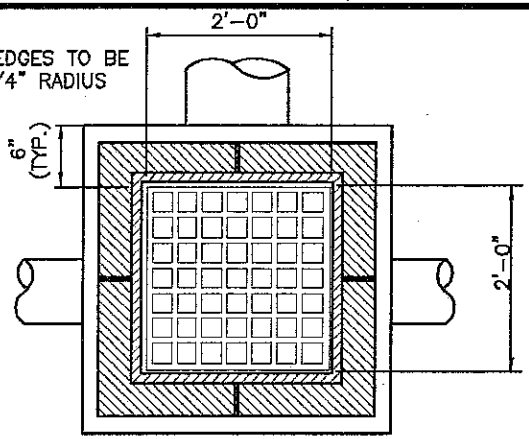
H. DROP FLOW LINE 1/2" WITHIN BLOCK OUT OF COMBINED CURB AND GUTTER WHILE KEEPING LIP OF GUTTER CONSISTENT WITH TOP OF CURB.

MERCER COUNTY CHOICE ONE ENGINEERING	# TYPE 1 CATCH BASIN	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 600-1

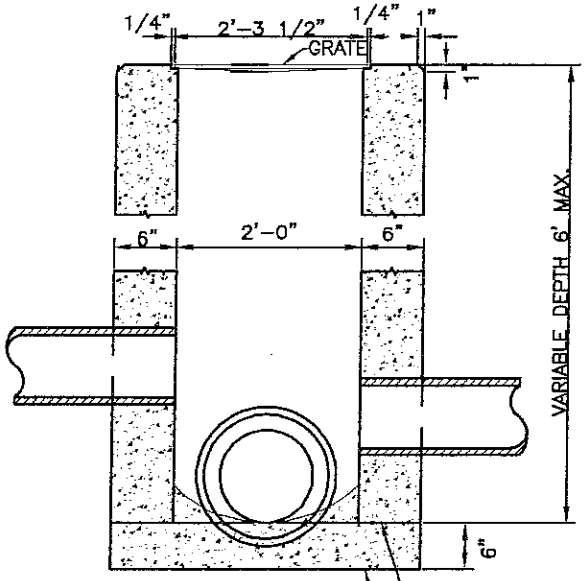


PLAN

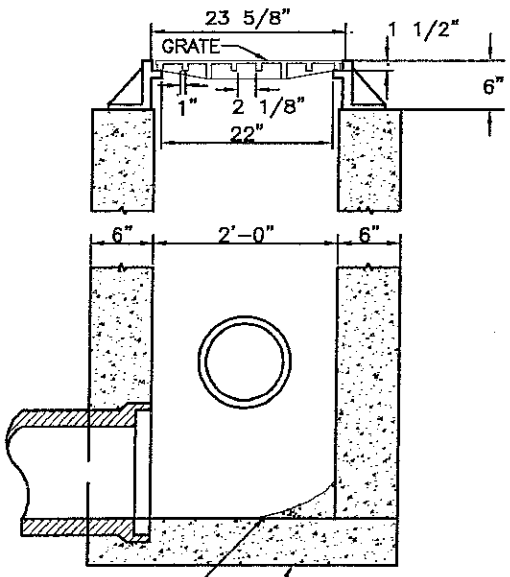
ALL GRATE EDGES TO BE ROUNDED 1/4" RADIUS



PLAN



NONPAVED AREAS



PAVED AREAS

PERMISSIBLE CONSTRUCTION JOINT

BOTTOM SLAB MAY BE CAST SEPARATELY AND THE OUTLET PIPE PLACED ON TOP OF IT WITH THE BOTTOM SHAPED TO DRAIN.

NOTES

A. LOCATION AND ELEVATIONS WHEN GIVEN ON THE PLANS IS TOP CENTER OF THE GRATE. WHEN SIDE OPENINGS ARE PROVIDED, ELEVATION SHALL BE THE FLOW LINE OF THE SIDE INLET.

B. GRATE FOR NONPAVED AREAS SHALL BE EAST JORDAN IRON WORKS 5110 TYPE M3 OR NEENAH CATALOG NO. R-4859-C OR EQUIVALENT.

C. GRATE ELEVATION TO BE PLACED 4" TO 6" BELOW NORMAL DITCH RETURNING TO NORMAL 10' EACH SIDE OF BASIN.

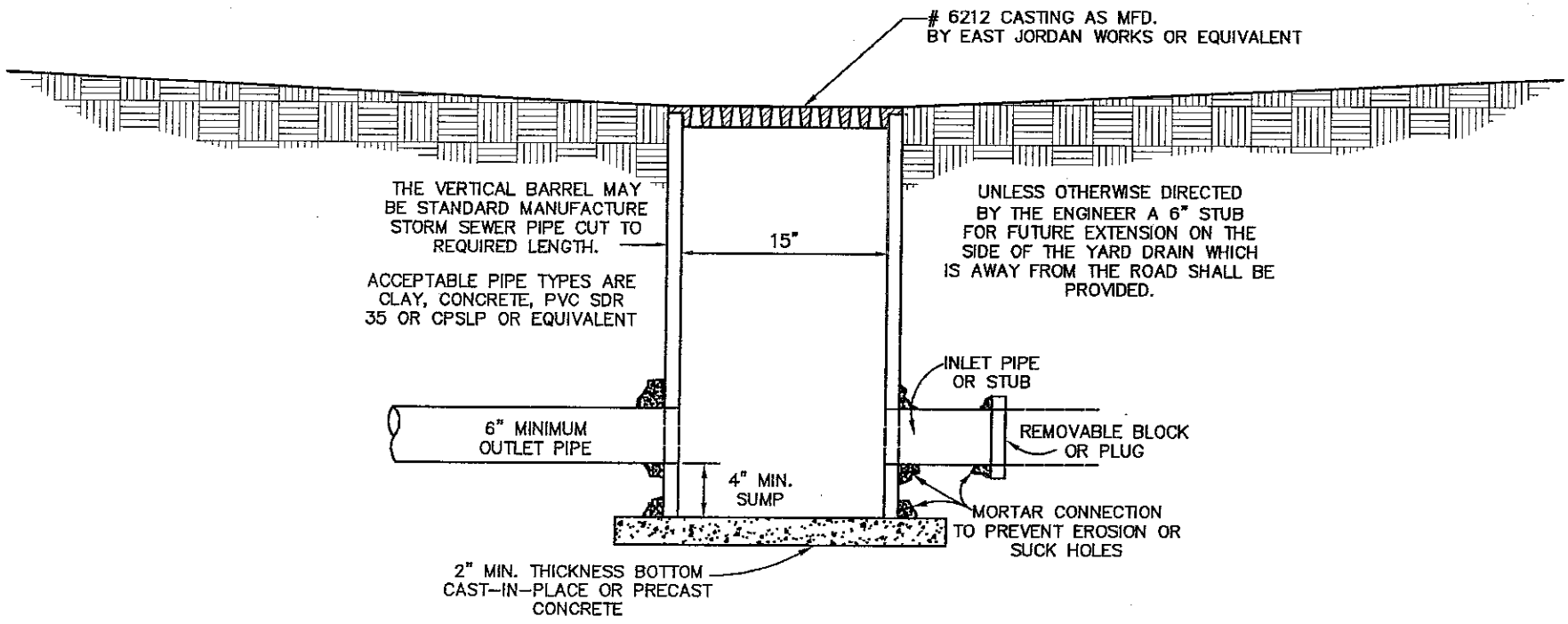
D. CONCRETE, CAST-IN-PLACE, TO BE CLASS C. PRECAST CONSTRUCTION PERMITTED AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6±+2% AIR VOID CONTENT IN THE HARDENED CONCRETE. KNOCKOUTS SHALL PROVIDED IN PRECAST CONSTRUCTION. PRECAST WALLS SHALL HAVE A SUFFICIENT AMOUNT OF REINFORCEMENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

E. CATCH BASINS NOT PERMITTED IN PAVEMENT AREAS UNLESS USING A FRAME AND GRATE EQUIVALENT OF NEENAH CATALOG NO. R-3405 OR EAST JORDAN IRON WORKS NO. 5250.

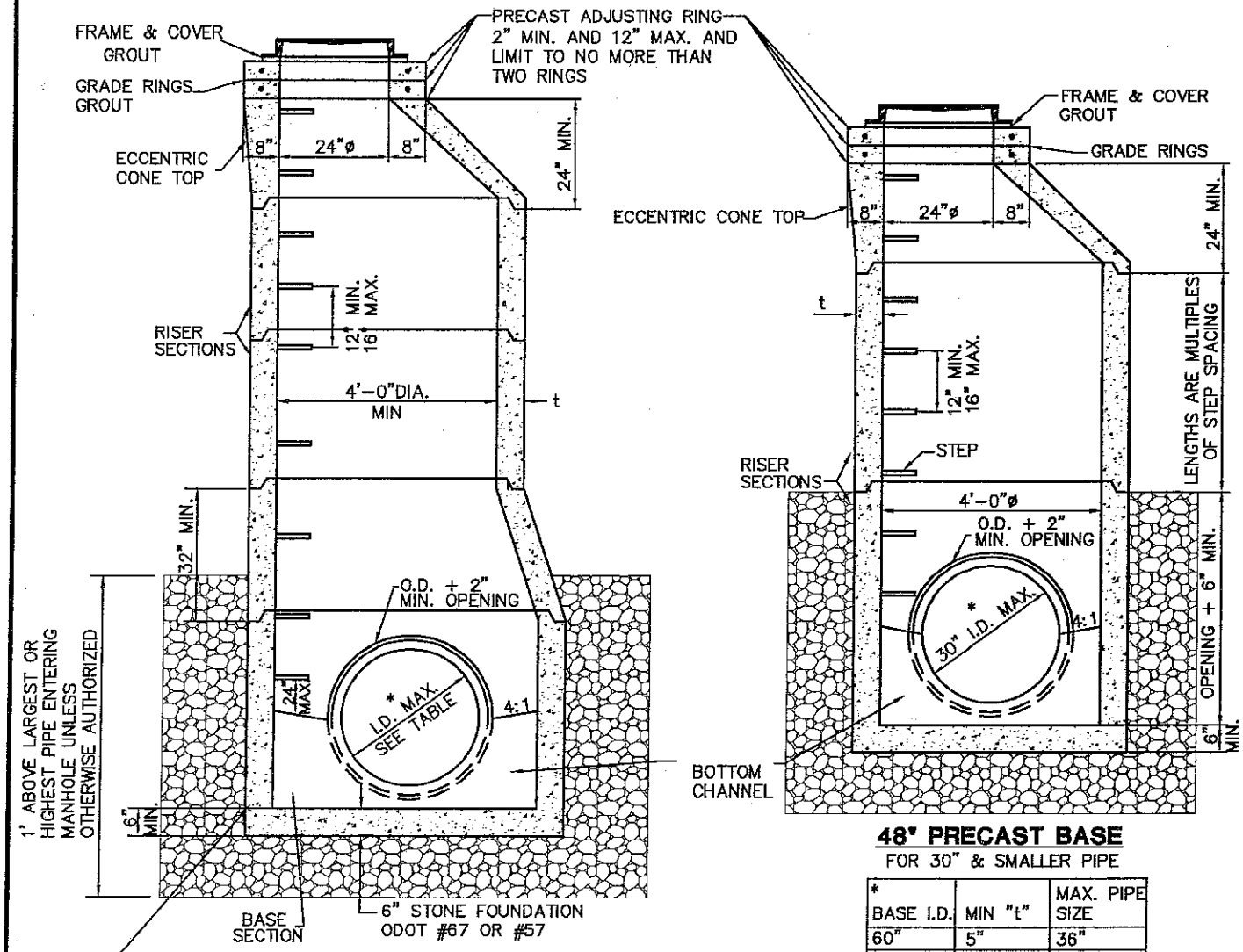
F. FOR PIPES OVER 18" REFER TO ODOT CATCH BASIN 2-3 AND 2-4. FOR SIDE INLETS REFER TO ODOT CATCH BASIN 2-2-A.

G. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO CATCH BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" ONLY AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.

MERCER COUNTY CHOICE ONE ENGINEERING	# TYPE 2-2-B CATCH BASIN	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 600-2



MERCER COUNTY CHOICE ONE ENGINEERING	# YARD DRAIN	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 600-3



60" TO 96" PRECAST BASE

SEE TABLE FOR MAXIMUM PIPE SIZES

PRECAST OR POURED IN PLACE BASE SECTION WITH 6" GRANULAR BEDDING. USE OF BARREL BLOCKS IS CONTINGENT UPON COUNTY APPROVAL AND THEN ONLY IN SPECIAL CASES.

48" PRECAST BASE

FOR 30" & SMALLER PIPE

* BASE I.D.	MIN "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7 1/2	60"
96"	8"	60"

*DUE TO PIPE ORIENTATION, LARGER DIAMETER BASE THAN WHAT IS SPECIFIED TO ACCEPT PIPE MAY BE REQUIRED.

NOTES

A. STORM MANHOLE FRAME AND APPROVED VENTED LID SHALL BE EQUAL OF NEENAH NO. R-1767 OR EAST JORDON IRON WORKS NO. 1600 SEWER.

B. SECTIONS OF THE PRECAST MANHOLE SHALL BE CAST AND ASSEMBLED WITH EITHER ALL TONGUE OR ALL GROOVE ENDS UP. LIFT HOLES MAY BE PROVIDED IN EACH SECTION FOR HANDLING.

C. TOP AND TRANSITION (OR REDUCER) SECTIONS MAY BE EITHER ECCENTRIC CONE OR FLAT SLAB.

D. OPENINGS IN RISER SECTIONS FOR 18" AND SMALLER INLET PIPES MAY BE PREFABRICATED OR CUT IN THE FIELD PROVIDED THE SIDES OF THE PIPE AT THE SPRING LINE DO NOT PROJECT INTO THE MANHOLE.

E. MATERIALS FOR BASES AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENT SHALL COMPLY WITH ODOT REQUIREMENT OF 706.13 (ASTM C-478).

F. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

G. FOR PIPE SIZES LARGER THAN 60", REFER TO ODOT TYPE 4 TO 5 MANHOLE.

H. NO LATERALS MAY PROTRUDE INTO THE INTERNAL MANHOLE.

I. MAXIMUM SPACING SHALL BE 400'.

J. WHEN CONNECTING TO AN EXISTING STORM MANHOLE CARE SHALL BE TAKEN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO STORM MANHOLE AND PIPE MUST BE CUT PARALLEL TO STORM MANHOLE. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND STORM MANHOLE.

K. JOINTS BETWEEN SECTIONS TO BE EITHER MORTAR OR BITUMINOUS PIPE JOINT FILLER (ODOT 706.10)

MERCER COUNTY

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TYPE 3 STORM MANHOLE

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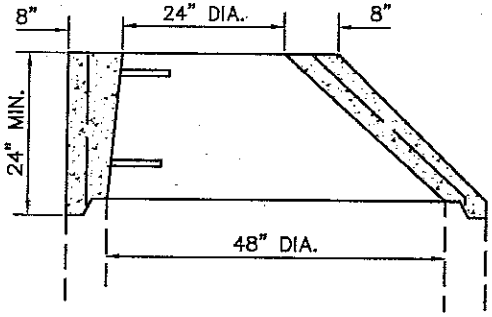
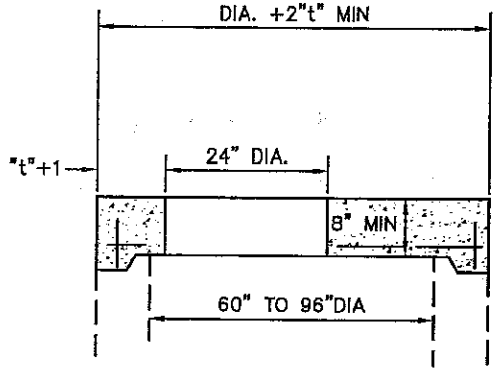
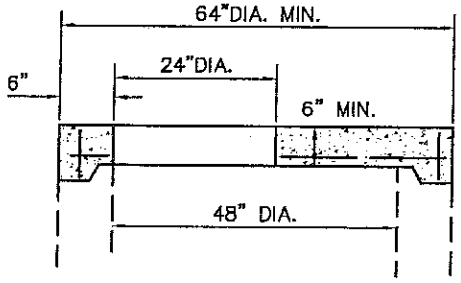


ECCENTRIC CONE TOP

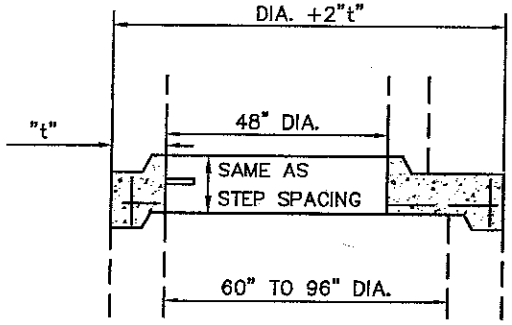


FLAT SLAB TOP

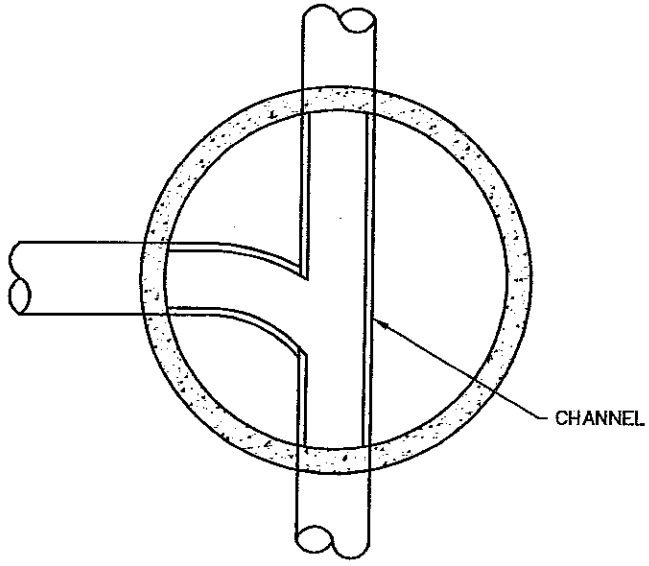
BASE I.D.	MIN "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7 1/2	60"
96"	8"	60"



FLAT SLAB TOP



FLAT SLAB TRANSITION



SECTIONAL PLAN

NOTE

ALL INVERTS TO BE CHANNELED FOR OPTIMUM FLOW.

MERCER COUNTY

CHOICE ONE ENGINEERING

TYPE 3 STORM MANHOLE DETAILS

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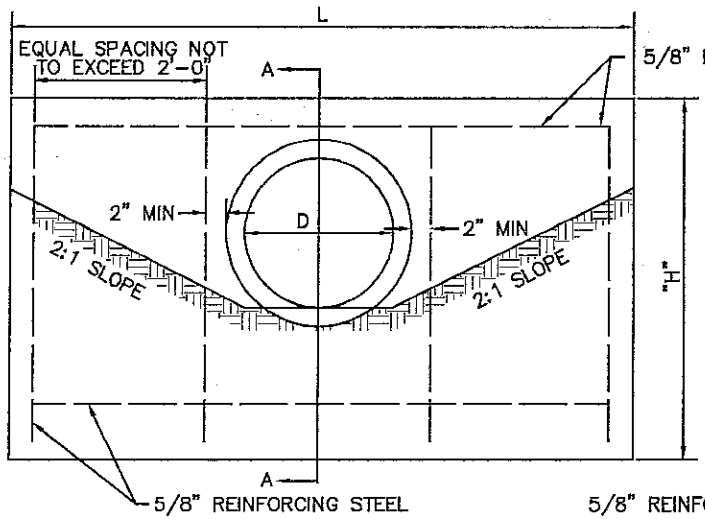
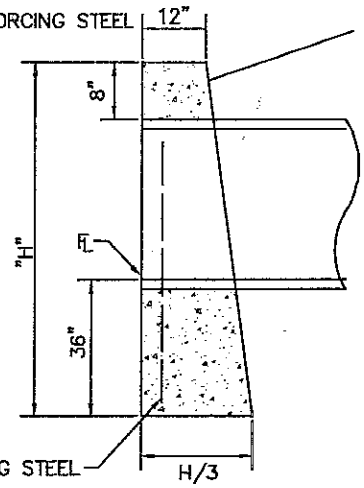
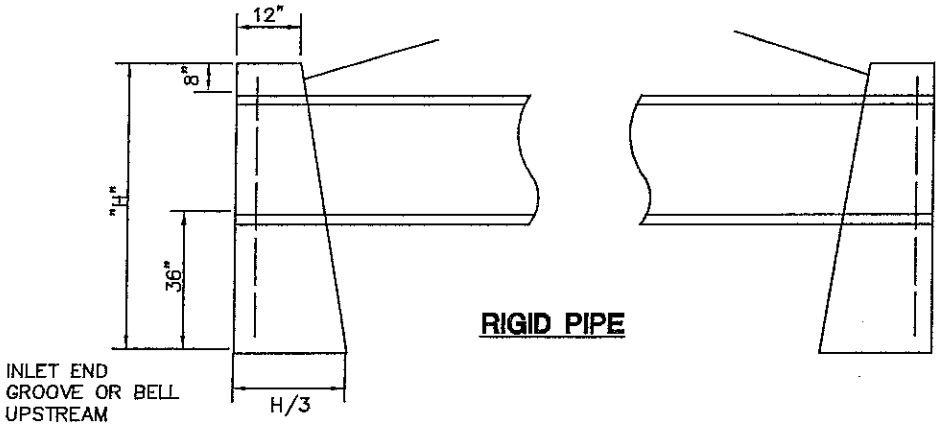


ELEVATION



SECTION A-A



RIGID PIPE

NOTES

A. THESE FULL HEIGHT HEADWALLS ARE FOR NONSKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS.

B. CONCRETE SHALL BE ODOT CLASS C. REINFORCED STEEL BARS SHALL BE 5/8" ROUND.

C. DIMENSIONS AND QUANTITIES ARE SHOWN FOR CIRCULAR SECTIONS ONLY. IT WILL BE NECESSARY TO DETERMINE DIMENSIONS FOR THE HW-1 HEADWALL REQUIRED FOR REINFORCED ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL PIPE ARCHES IN ACCORDANCE WITH THE EQUATIONS LISTED ON THIS DRAWING.

D. CHAMFER ALL EXPOSED CORNERS 3/4".

E. WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 LBS. PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF THE BASE.

F. MINIMUM COVER FOR REINFORCING STEEL SHALL BE 2".

G. FOR PIPES HAVING A DIAMETER OR RISE OVER 36", REFERENCE ODOT HW-3 HEADWALLS FOR FULL HEIGHT HEADWALL.

H. FOR SKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS, REFERENCE ODOT HW-2 HEADWALLS.

I. HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.

J. LAST 20± OF PIPE BEFORE HEADWALL SHALL BE REINFORCED CONCRETE PIPE.

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	HEIGHT	LENGTH	CONCRETE C.Y.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS = 5D + 4T
L ELLIPTICAL OR PIPE-ARCH = 4R + 4T + S
H CIRCULAR SECTIONS = D + T + 44"
H ELLIPTICAL OR PIPE-ARCH = R + T + 44"

D = DIAMETER OF PIPE
R = RISE OF PIPE
S = SPAN OF PIPE
T = THICKNESS OF BARREL
L = LENGTH OF HEADWALL
H = HEIGHT OF HEADWALL

MERCER COUNTY
CHOICE ONE ENGINEERING

FULL-HEIGHT HEADWALLS

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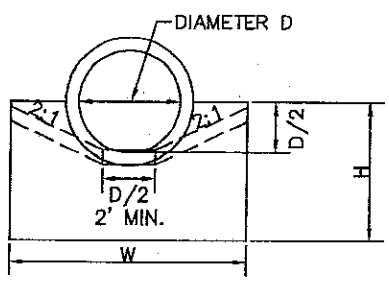
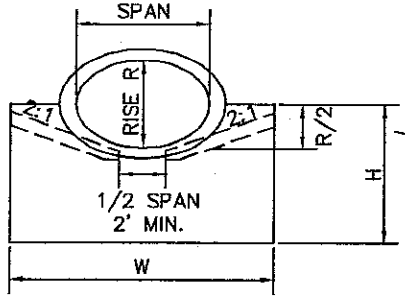
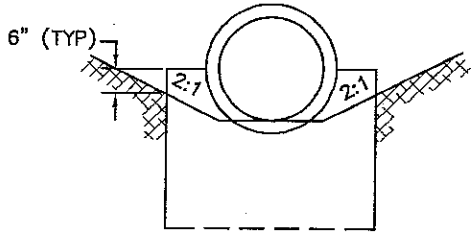


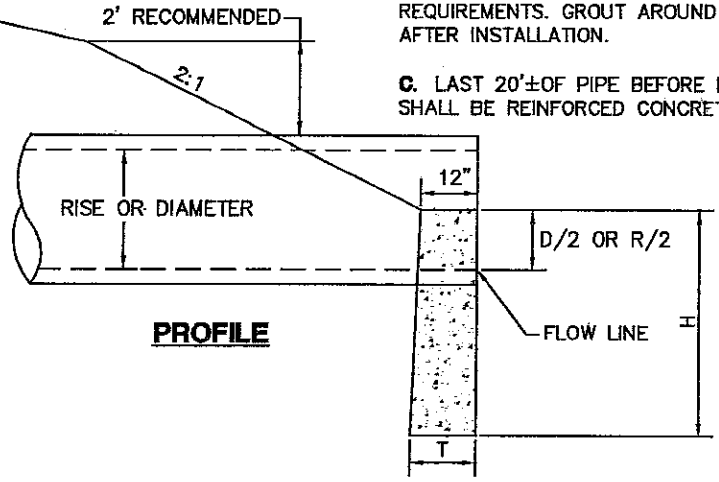
CIRCULAR



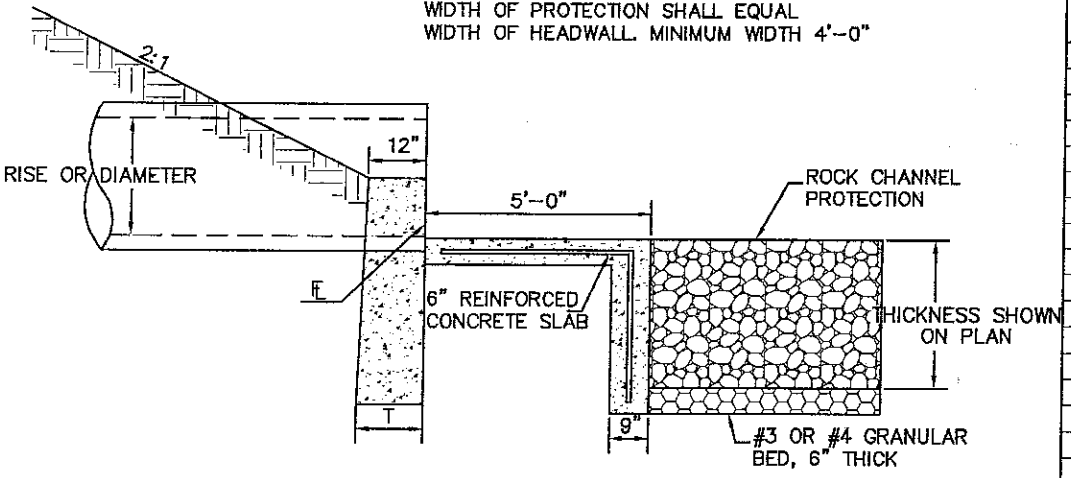
ELLIPTICAL



WIDTH OF PROTECTION SHALL EQUAL
WIDTH OF HEADWALL. MINIMUM WIDTH 4'-0"



PROFILE



OUTLET CHANNEL PROTECTION DETAIL

(CUTOFF WALL DEPTH 2'-6" MINIMUM IS VARIABLE TO MATCH REQUIRED THICKNESS OF ROCK.)

NOTES

A. CONCRETE FOR HEADWALLS SHALL BE ODOT CLASS C. CONCRETE QUANTITIES ARE BASED ON HEADWALLS ONLY.

B. HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.

C. LAST 20'±OF PIPE BEFORE HEADWALL SHALL BE REINFORCED CONCRETE PIPE.

HEADWALL FOR CONCRETE PIPE

CIRCULAR				CONC.	ELLIPTICAL					CONC.
D	W	H	T	C.Y.	SPAN	RISE	W	H	T	C.Y.
12"	2'-0"	3'-0"	12"	.20	23"	14"	3'-0"	3'-2"	12"	.29
15"	2'-6"	3'-2"	12"	.25	30"	19"	3'-7"	3'-4"	12"	.35
18"	3'-0"	3'-3"	12"	.31	34"	22"	3'-11"	3'-5"	12"	.38
21"	3'-6"	3'-4"	12"	.37	38"	24"	4'-6"	3'-6"	12"	.44
24"	4'-0"	3'-6"	12"	.43	42"	27"	4'-8"	3'-7"	12"	.45
27"	4'-6"	3'-8"	12"	.49	45"	29"	5'-2"	3'-8"	12"	.49
30"	5'-0"	3'-9"	12"	.56	49"	32"	5'-5"	3'-10"	12"	.52
33"	5'-6"	3'-10"	12"	.62	53"	34"	5'-11"	4'-0"	14"	.66
36"	6'-0"	4'-0"	12"	.69	60"	38"	6'-10"	4'-2"	14"	.82
39"	6'-6"	4'-2"	12"	.77	68"	43"	8'-0"	4'-4"	16"	1.01
42"	7'-0"	4'-3"	12"	.84	76"	48"	9'-2"	5'-0"	16"	1.34
48"	8'-0"	4'-6"	14"	1.09	83"	53"	10'-4"	5'-2"	18"	1.65
54"	9'-3"	4'-9"	14"	1.32	91"	58"	11'-6"	5'-5"	18"	1.97
60"	10'-6"	5'-6"	16"	1.93	98"	63"	12'-7"	5'-7"	20"	2.38
66"	11'-9"	5'-9"	18"	2.42	106"	68"	13'-9"	5'-10"	20"	2.69
72"	13'-0"	6'-0"	18"	2.77	113"	72"	14'-9"	6'-0"	22"	3.14
78"	14'-3"	6'-3"	20"	3.37	121"	77"	15'-11"	6'-3"	22"	3.49
84"	15'-6"	6'-6"	22"	4.05	128"	82"	17'-0"	6'-5"	24"	4.04

MERCER COUNTY

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HALF-HEIGHT HEADWALL

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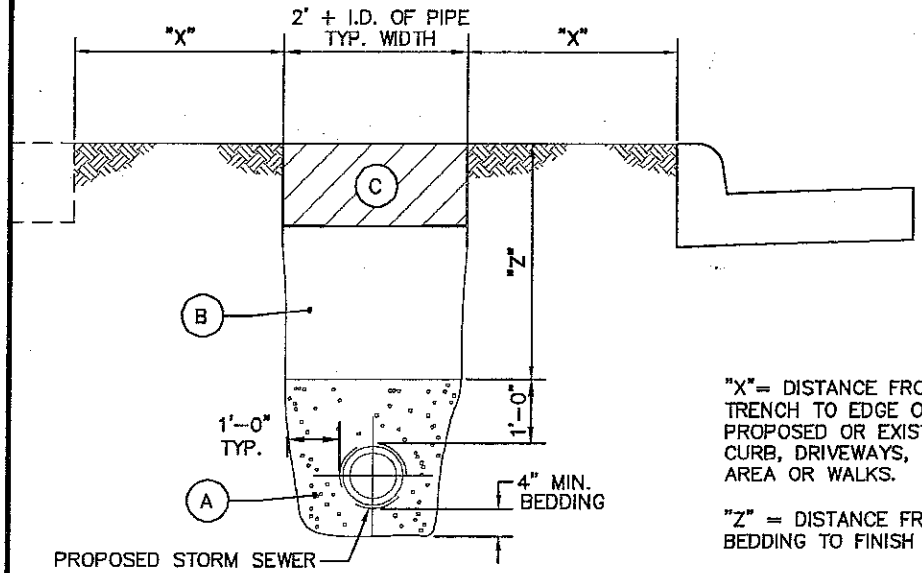
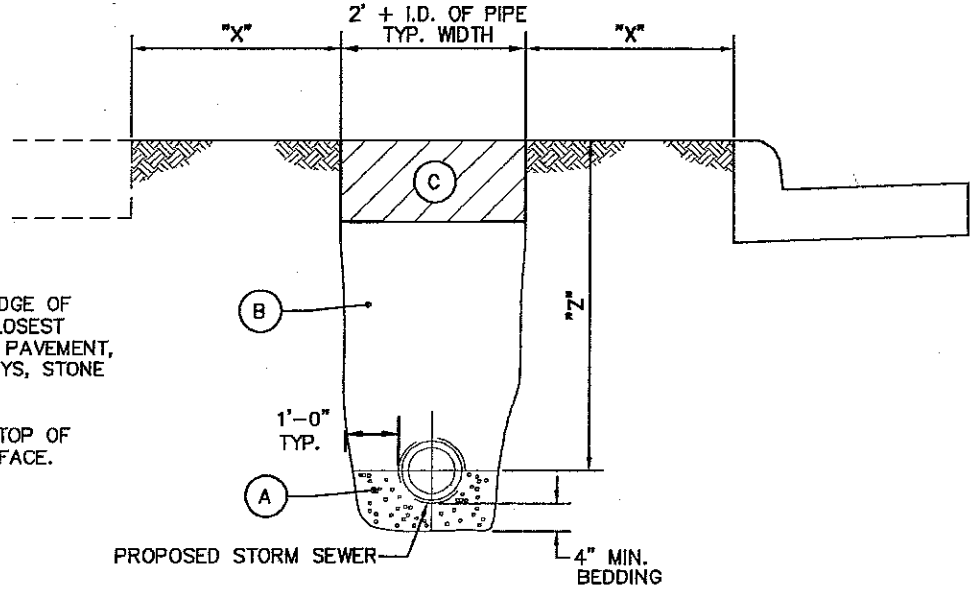


STORM SEWER TRENCH DETAIL

(NON-RIGID PIPE)

"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.



STORM SEWER TRENCH DETAIL

(RIGID PIPE)

TRENCH DETAIL NOTES

A. GRANULAR BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #67), OR OTHER APPROVED EQUIVALENT.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE COUNTY. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

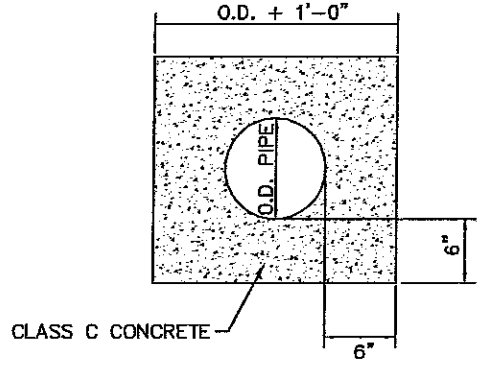
ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH GRANULAR BACKFILL MATERIAL ODOT 603 TYPE 1 OR TYPE 2, IN 6" MAXIMUM LIFTS OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED GRANULAR BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

A DENSITY TEST ON GRANULAR BACKFILL OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAYBE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE COUNTY.

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

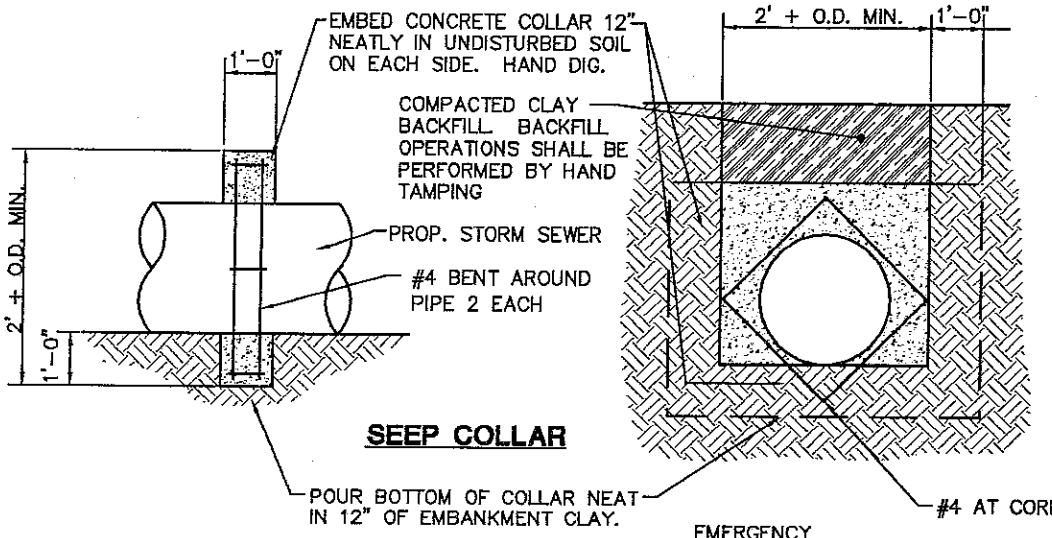
IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-18.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE COUNTY BEFORE LEAVING THE WORK FOR THE NIGHT.

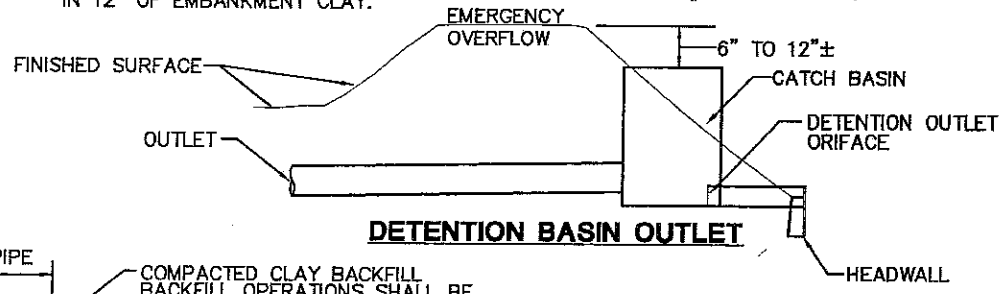


CONCRETE ENCASEMENT DETAIL

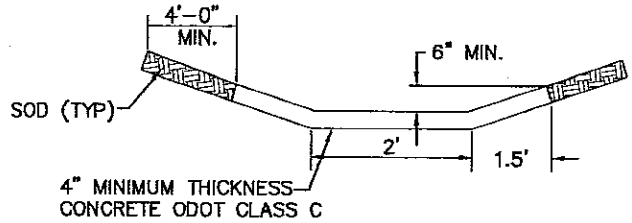
MERCER COUNTY CHOICE ONE ENGINEERING	STORM SEWER TRENCH DETAILS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300-8



SEEP COLLAR



DETENTION BASIN OUTLET



PAVED CONCRETE CHANNEL DETAIL

NOTES

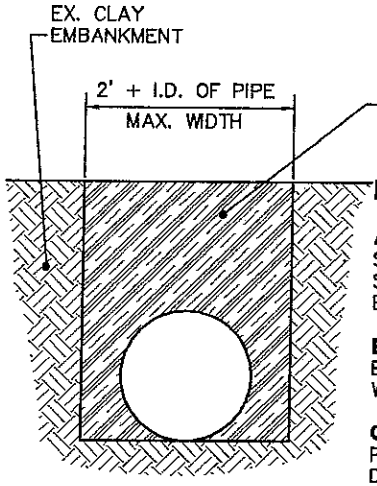
A. ANY DETENTION BASINS WITH SLOPES LESS THAN 1% REQUIRE CONCRETE CHANNEL.

B. DIFFERENT SHAPE OR SIZE OF CONCRETE CHANNEL MAY BE REQUIRED DEPENDING ON DESIGN.

C. ALL WORK SHALL BE DONE IN ACCORDANCE WITH COUNTY SPECIFICATIONS.

D. BOTTOM OF DRAINAGE DITCH SHALL BE FORMED BEFORE PLACING CONCRETE, ALL FORMS SHALL BE SET TO GRADE AND ALIGNMENT.

E. TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED AT 6 FOOT INTERVALS. THE GROOVES SHALL BE SAW CUT TO A MINIMUM DEPTH OF 1 INCH.



CLAY TRENCH DETAIL THROUGH DETENTION BASIN

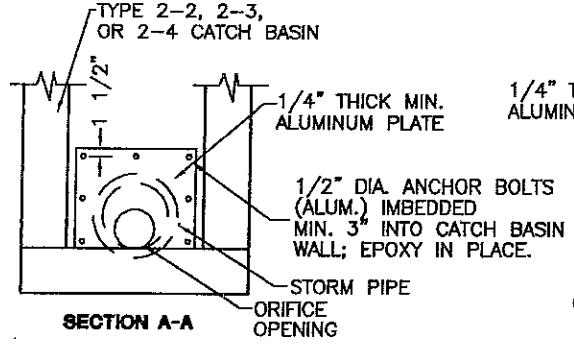
NOTES

A. EXTRA COMPACTION AND CARE SHALL BE TAKEN TO ENSURE WATER SEALING OF DIKE AND PROPER CLAY BEDDING OF PIPE.

B. COMPACTION REQUIREMENTS SHALL BE 95% STANDARD MAXIMUM DRY WEIGHT DENSITY.

C. THIS SHALL BE REQUIRED AT ALL PIPES ENTERING OR EXITING THE DETENTION BASIN.

D. PAYMENT FOR THESE ITEMS SHALL BE INCIDENTAL TO ITEM 603.



DETENTION/RETENTION OUTLET ORIFICE

MERCER COUNTY

CHOICE ONE ENGINEERING

DETENTION/RETENTION BASIN DETAILS

REVISIONS:

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NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE COUNTY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE COUNTY.
B ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE COUNTY.

C. ALL STORM SEWER CONSTRUCTION SHALL ADHERE TO ODOT SPECIFICATIONS LATEST REVISION OR WITH THE COUNTY STORM SEWER SPECIFICATIONS, WHICHEVER IS APPLICABLE AND MORE RESTRICTIVE.

D. BITUMINOUS MASTIC FILLER IS REQUIRED ON ALL NON O-RING STORM SEWER AND MANHOLES, UNLESS OTHERWISE APPROVED.

E. WHEN A CASTING IS ABANDONED IT REMAINS COUNTY PROPERTY.

F. ANY DETAILS OR NOTES NOT DIRECTLY ADDRESSED IN THESE ENGINEERING STANDARDS WILL BE REFERRED TO ODOT STANDARD DRAWINGS AND SPECIFICATIONS.

G. ALL STORM SEWER SHALL BE INSTALLED USING A LASER FOR GRADE AND ALIGNMENT.

UTILITY STAKING

A. OFFSET AND GRADE AT EACH MANHOLE, CATCH BASIN, AND OTHER STRUCTURES. OFFSET AND GRADE 50' AND 100' OUT FROM EACH MANHOLE UNLESS OTHERWISE APPROVED.

PIPE

A. ALL STORM SEWER PIPE SHALL HAVE A MINIMUM DIAMETER OF 12", UNLESS OTHERWISE APPROVED.

B. TYPES OF PIPE PERMITTED

UP TO 30" DIAMETER	ODOT MATERIALS NUMBER
REINFORCED CONCRETE PIPE	706.02
REINFORCED CONCRETE ELLIPTICAL PIPE	706.04
CORRUGATED POLYETHYLENE SMOOTH-LINED PIPE	707.33
POLYVINYL CHLORIDE PLASTIC PIPE (NON-PERFORATED)	707.41
POLYVINYL CHLORIDE CORRUGATED SMOOTH-INTERIOR PIPE	707.42
POLYVINYL CHLORIDE PROFILE WALL PIPE	707.43
POLYVINYL CHLORIDE SOLID WALL PIPE	707.45

OVER 30" DIAMETER	ODOT MATERIALS NUMBER
REINFORCED CONCRETE PIPE	706.02
REINFORCED CONCRETE ELLIPTICAL PIPE	706.04

EXISTING TILE HOOKUPS

A. THE DRAINAGE TILE CURRENTLY CONNECTED TO THE EXISTING STORM SEWER SHALL BE CONNECTED TO THE PROPOSED STORM SEWER. ANY DRAINAGE TILE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. ALL THE REMOVED, REPLACED, AND/OR CONNECTED TO THE STORM SEWER SHALL BE NOTED ON THE AS-BUILT DRAWINGS AND SHALL BE INSPECTED BY THE INSPECTOR BEFORE THEY ARE COVERED.

B. ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS OR PLUGGED AS APPROVED AND DIRECTED BY THE COUNTY.

NOTES

A. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL CONSTRUCTION PROJECTS HAVING SIGNIFICANT GRADING. THE CONTROLS ARE PROVIDED DURING CONSTRUCTION TO PREVENT SOIL ERODED FROM THE CONSTRUCTION AREA FROM ENTERING ADJACENT WATER COURSES.

B. CONSTRUCTION ITEMS INCLUDE SEDIMENT BASINS, SEDIMENT DAMS, DIVERSION DIKES AND/OR DITCHES AND STRAW BALES OR OTHER FILTER DIKES SHOWN ON ODOT STANDARD DRAWING MC-11. OTHER MISCELLANEOUS EROSION CONTROL MEASURES INCLUDE REPAIR SEEDING AND MULCHING, COMMERCIAL FERTILIZER, WATER AND MOWING AND ROCK CHANNEL PROTECTION, COVERED IN ODOT SPECIFICATION ITEMS 659 AND 601.

C. THE SIZE OF THE ENTIRE DRAINAGE AREA CONTRIBUTING FLOW IS USED TO DETERMINE THE MOST EFFECTIVE EROSION CONTROL METHOD. IN MANY CASES, THE MAJOR PORTION OF THE CONTRIBUTING AREA WILL BE BEYOND THE PROJECT LIMITS, AND FOR THOSE CASES IT WILL BE NECESSARY TO CONTROL THE FLOW FROM OUTSIDE BEFORE IT REACHES THE AREA DISTURBED BY PROJECT CONSTRUCTION. FLOW FROM THE AREA DISTURBED BY CONSTRUCTION SHALL BE TREATED PRIOR TO COMBINING IT WITH OFF-PAVEMENT DRAINAGE.

D. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL SUBDIVISIONS AND INDIVIDUAL SITES UNLESS OTHERWISE APPROVED. THE CONTROL MEASURES ARE TO BE PROVIDED DURING CONSTRUCTION TO PREVENT EROSION FROM ENTERING ADJACENT WATERWAYS AND PROPERTIES.

PLAN SUBMITTAL

A. ALL SITE PLANS SHALL INCLUDE APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICES AND SHALL BE SUBMITTED TO THE COUNTY FOR APPROVAL PRIOR TO COMMENCEMENT OF ANY WORK UNLESS OTHERWISE APPROVED. ALL PROJECTS WHICH DISTURB 5 ACRES OR MORE MUST HAVE OEPA EROSION CONTROL APPROVALS.

CONSTRUCTION

A. ALL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSPECTED AND APPROVED BY THE COUNTY UNLESS OTHERWISE APPROVED.

STORM WATER PERMITS

A. ON ALL PROJECTS WHICH DISTURB AT LEAST 5 ACRES OF SOIL, A NPDES PERMIT IS REQUIRED FROM OEPA AND A COPY OF THE PERMIT MUST BE ON FILE AT THE COUNTY BEFORE CONSTRUCTION BEGINS.

CONTROL MEASURES

A. DISTURB ONLY THE AREAS NEEDED FOR CONSTRUCTION.

B. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION; PROTECT THE REST TO PRESERVE THEIR ESTHETIC AND EROSION-CONTROL VALUES. TREES SHALL BE REPLACED AFTER CONSTRUCTION IS COMPLETE AT THE DEVELOPER'S COST.

C. INSTALL SEDIMENT BASINS AND DIVERSION DIKES BEFORE DISTURBING THE LAND THAT DRAINS INTO THEM.

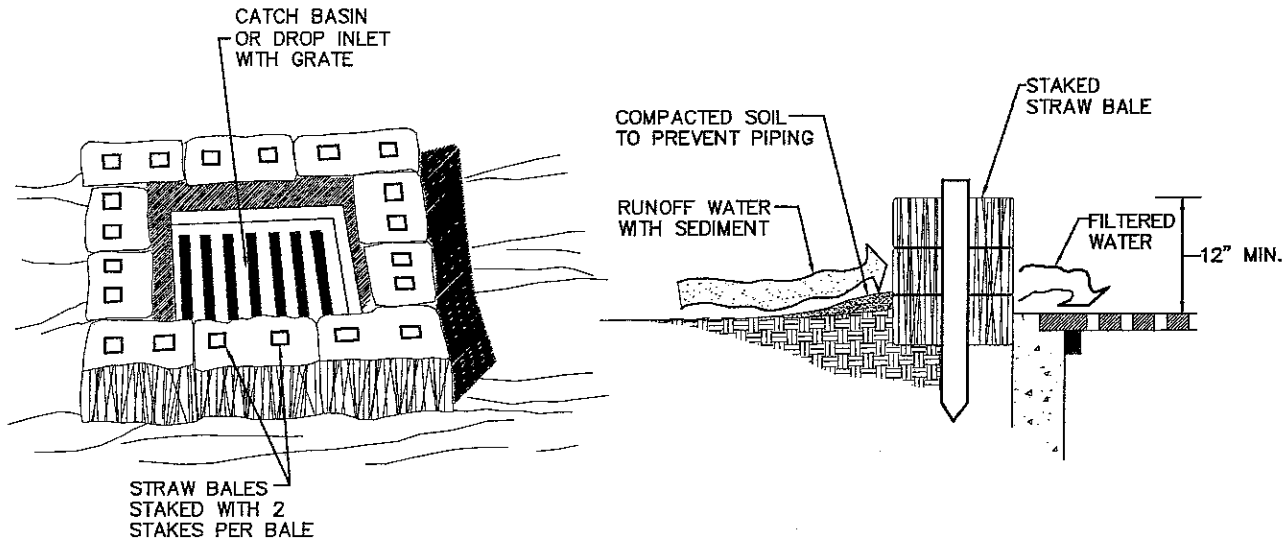
D. INSTALL EROSION AND SEDIMENT CONTROL PRACTICES AS INDICATED IN THE PLAN. THE PRACTICES ARE TO BE MAINTAINED IN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND UNTIL THE DRAINAGE AREAS HAVE BEEN PERMANENTLY STABILIZED.

E. TEMPORARILY STABILIZE EACH SEGMENT, GRADED OR OTHERWISE DISTURBED LAND, INCLUDING THE SEDIMENT-CONTROL DEVISES NOT OTHERWISE STABILIZED, BY SEEDING AND MULCHING OR BY MULCHING ALONE. AS CONSTRUCTION IS COMPLETED, PERMANENTLY STABILIZE EACH SEGMENT WITH PERENNIAL VEGETATION AND STRUCTURAL MEASURES.

F. LEVEL DIVERSION DIKES, SEDIMENT BASINS, AND SILT TRAPS AFTER AREAS THAT DRAIN INTO THEM ARE STABILIZED. ESTABLISH PERMANENT VEGETATION ON THESE AREAS. SEDIMENT BASINS THAT ARE TO BE RETAINED FOR STORM WATER DETENTION MAYBE SEEDED TO PERMANENT VEGETATION AFTER THEY ARE BUILT.

G. DISCHARGE WATER FROM OUTLET STRUCTURES AT NON-EROSIVE VELOCITIES.

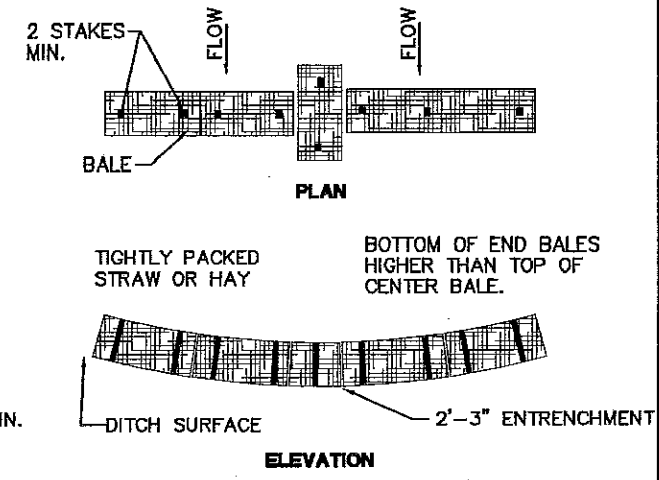
MERCER COUNTY CHOICE ONE ENGINEERING	# EROSION CONTROL NOTES	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 600-11



BALE INLET FILTER

NOTES

A. THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THEN 5%) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 CFS) ARE TYPICAL.



BALE DITCH CHECK

NOTES

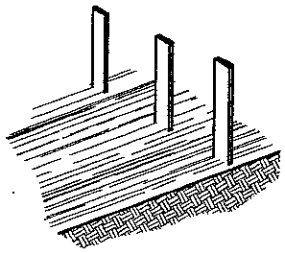
A. PLACEMENT OF BALES SHALL BE TIGHTLY PLACED, ADJACENTLY, AND ENTRENCHED 2" AND 3" BEFORE STAKING AND A SMALL AMOUNT OF LOOSE SOIL SHALL BE LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF THE BALES OR SEE ODOT STANDARD CONSTRUCTION DRAWING MC–11.

B. EACH BALE SHALL BE FIRMLY STAKED WITH A MINIMUM OF 2 STAKES AT LEAST 3' IN LENGTH. STAKE SHALL BE WOODEN 2" X 2", REINFORCING BARS OR FENCE POST, AS APPROVED BY THE COUNTY.

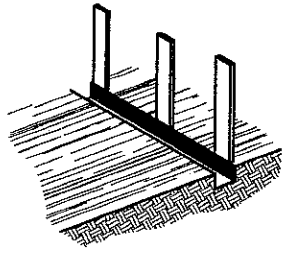
C. LOOSE STRAW OR HAY SHALL BE SCATTERED FOR A DISTANCE OF 10' ON THE UPSTREAM SIDE OF EACH DITCH CHECK, AND SHALL BE WEDGED BETWEEN AND UNDER STAKED BALES.

MERCER COUNTY CHOICE ONE ENGINEERING	# STRAW OR HAY BALES # TEMPORARY EROSION CONTROL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–12

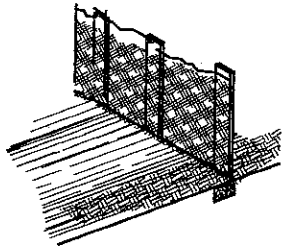
A. SET STAKES NO MORE THAN 3' APART AND DRIVE THEM INTO THE GROUND AT LEAST 8".



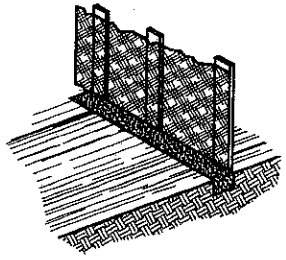
B. EXCAVATE A 4" x 4" TRENCH UP SLOPE ALONG THE LINE OF STAKES.

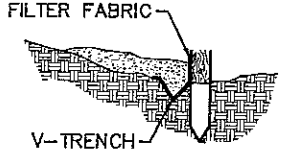


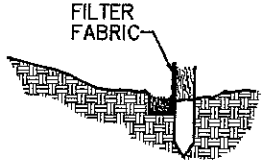
C. STAPLE FILTER MATERIAL ON UP SLOPE SIDE OF STAKES AND EXTEND IT INTO THE TRENCH. WHEN JOINTS ARE NECESSARY, OVERLAP MATERIAL BETWEEN 2 STAKES AND FASTEN SECURELY.



D. BACKFILL AND COMPACT THE EXCAVATED SOIL.







MERCER COUNTY

CHOICE ONE ENGINEERING

SILT FENCE
TEMPORARY EROSION CONTROL

REVISIONS:

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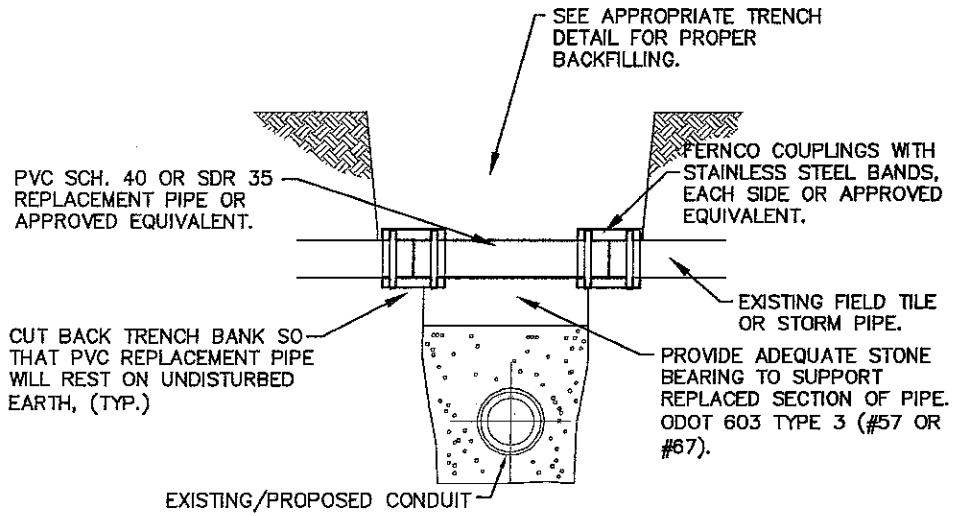


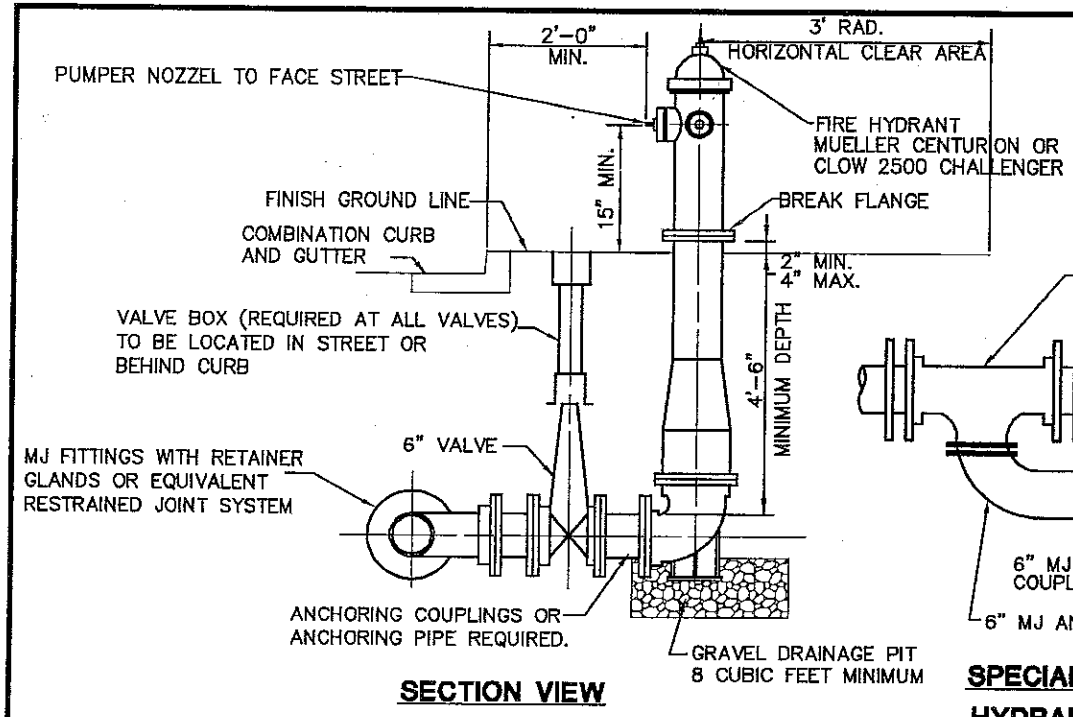
REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL

NOTES

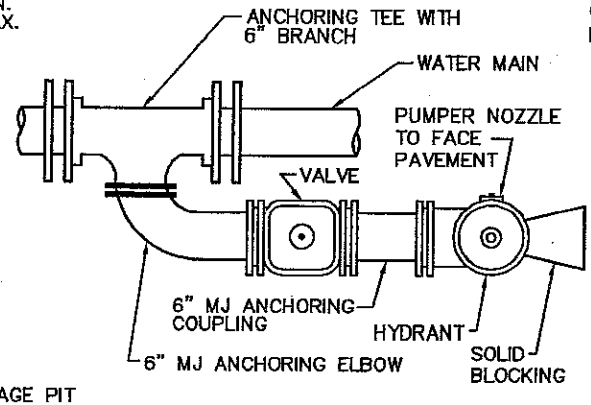
CONCRETE REPAIRS OR PATCHES ARE UNACCEPTABLE.

MERCER COUNTY CHOICE ONE ENGINEERING	REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–14

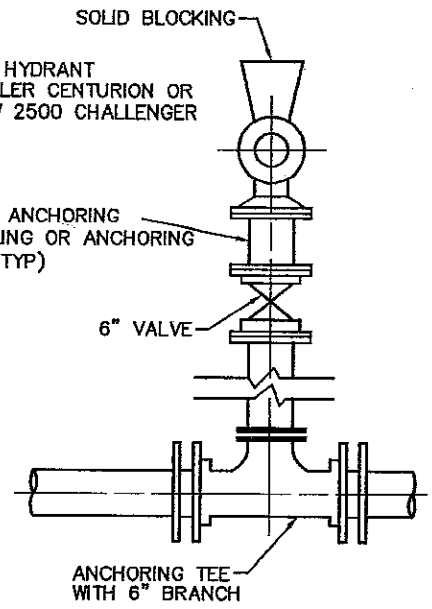
800 - WATER DISTRIBUTION



SECTION VIEW



SPECIAL MECHANICAL JOINT HYDRANT TEE DETAIL PLAN



BASIC TEE DETAIL PLAN

NOTES

A. FIRE HYDRANTS SHALL BE SELF DRAINING CLOW 2500 CHALLENGER OR MUELLER CENTURION, A-423, MECHANICAL JOINT, WITH (2) 2 1/2" HOSE NOZZLES WITH NST, (1) 4 1/2" PUMPER NOZZLE, NATIONAL STANDARD THREADS CONFORMING TO AWWA CCW TO OPEN, 6" SUPPLY PIPING WITH 6" MECHANICAL JOINT INLET.

B. HYDRANTS SHALL HAVE 6" WATCH VALVE INSTALLED ON THE HYDRANT LEG LOCATION NO CLOSER THAN 24" TO THE HYDRANT. THEY SHALL BE GATE VALVES AWWA C-509, RESILIENT WEDGE, NON-RISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN WITH ARROW INDICATING OPEN DIRECTION, MUELLER OR EQUIVALENT.

C. VALVE BOXES SHALL BE 3-PIECE CAST IRON 6" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.

D. ALL FITTINGS TO BE AWWA C-153 DUCTILE IRON, COMPACT AND RESTRAINED.

E. ALL VALVES AND HYDRANTS SHALL OPEN LEFT BY TURNING IN A COUNTERCLOCKWISE DIRECTION.

F. HYDRANT ORIENTATION AND LOCATION SHALL BE SUCH THAT THE NOZZLES ARE EASILY ACCESSIBLE FROM THE NEAREST ROADWAY. PUMPER NOZZLE SHALL FACE THE ROADWAY OR AS DETERMINED BY THE FIRE DEPARTMENT.

G. WATER MATERIAL SHALL BE DUCTILE IRON PIPE CLASS 52, AWWA C-151, SLIP-ON JOINTS WITH RUBBER GASKETS, OR PVC-150, DR-18, AWWA C-900 WITH MEGALUG RESTRAINS OR EQUIVALENT.

H. A DRAINAGE PIT OF A MINIMUM OF 8 CUBIC FEET GRADED AGGREGATE SHALL BE PROVIDED AT THE BASE THE HYDRANT SUFFICIENT TO ALLOW COMPLETE DRAINAGE OF HYDRANT WITHIN 20 MINUTES.

I. THERE SHALL BE A 15" CLEAR RADIUS AROUND EACH NOZZLE TO ALLOW FOR UNOBSTRUCTED TURNING OF A STANDARD HYDRANT WRENCH.

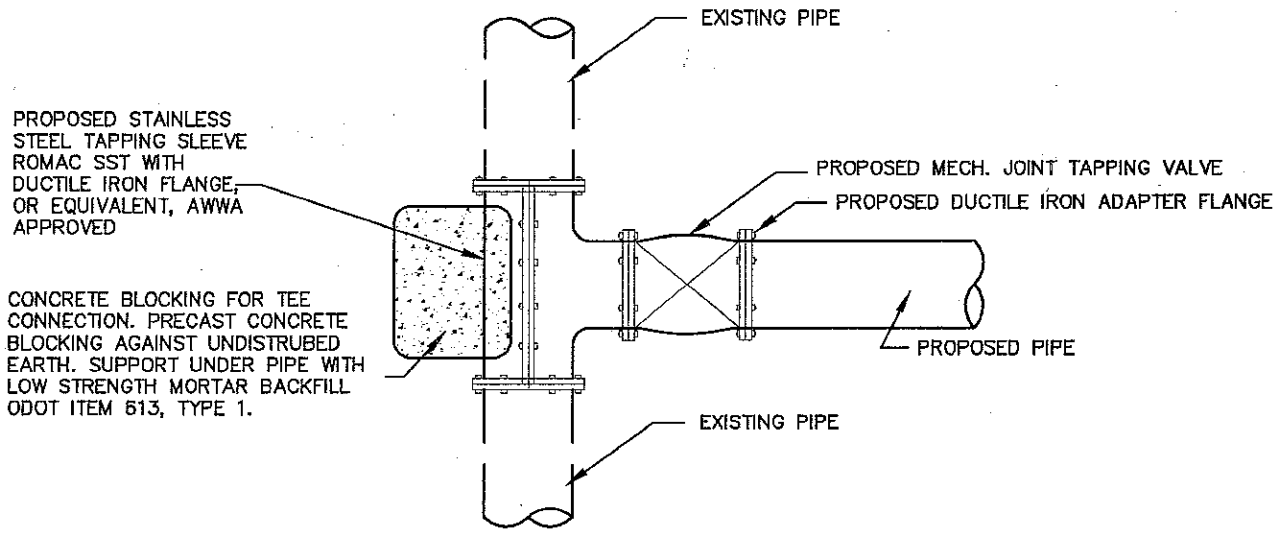
J. HYDRANT BASE SHALL BE BLOCKED WITH NON-DEGRADEABLE MATERIAL TO UNDISTURBED GROUND. HYDRANT SHALL DRAIN.

K. FIRE DEPARTMENT PERSONNEL WILL FLOW TEST EACH HYDRANT AND CHECK EACH FOR DRAINAGE. THEY WILL CONFIRM SUFFICIENT HYDRANT WRENCH CLEARANCE AND FINISH GRADE LOCATION. THE WORK WILL NOT BE ACCEPTED BY THE COUNTY UNTIL WRITTEN APPROVAL IS RECEIVED FROM THE FIRE DEPARTMENT.

L. ON CONSTRUCTION PROJECTS REQUIRING THE INSTALLATION OF NEW WATER MAIN AND HYDRANT, THE HYDRANT IS TO BE INSTALLED, APPROVED, AND ACTIVATED READY FOR USE BEFORE ANY BUILDING CONSTRUCTION IS STARTED.

M. THE HYDRANT SHALL BE PLACED SO THAT THE FLANGE IS BETWEEN 2 INCHES TO 4 INCHES + (PLUS OR MINUS), ABOVE FINISH GRADE. GRADELOK OFFSET NIPPLES BY ASSURED FLOW SALES INC. OR APPROVED EQUAL MAY BE USED FOR GRADE ADJUSTMENT.

MERCER COUNTY CHOICE ONE ENGINEERING	# FIRE HYDRANT	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800-1



TAPPING SLEEVE AND VALVE DETAIL

STAINLESS STEEL REPAIR CLAMPS AND TAPPING SLEEVE NOTES

A. BAND SHALL BE CONSTRUCTED OF 304 (18–8) STAINLESS STEEL WITH TEFLON COATED, ROLLED N.C. THREAD BOLTS. NUTS, BOLTS AND SIDEBARS SHALL BE 304 (18–8) STAINLESS STEEL.

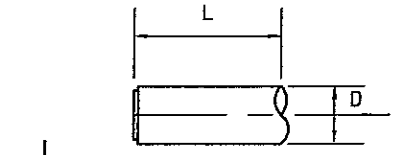
B. LIFT BARS WILL BE A HEAVY GAUGE 304 (18–8) STAINLESS STEEL AND WILL HAVE A LIP CURVE TO HOLD THE BOLTS IN PLACE WHILE TIGHTENING THE CLAMP. A SELF–LUBRICATING WASHER WILL BE USED BETWEEN THE HEX NUT AND LIFTER BAR ASSEMBLY. gASKETS WILL MEET ASTM D2000–(AA415) AND HAVE GRIDS IN A SQUARE PATTERN AND TAPERED ENDS, MADE OF vIRGIN SBR RUBBER COMPOUNDED FOR WATER SERVICE.

RESTRAINED JOINTS NOTES

A. BELL JOINT RESTRAINTS – FOR PVC, USE EBAA IRON SERIES 1500 OR EQUIVALENT. FOR DIP, USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.

B. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

C. CONTRACTOR TO USE RESTRAINED JOINTS UNLESS THRUST BLOCKING IS PREAPPROVED FOR SPECIAL CONDITIONS BY THE VILLAGE PRIOR TO THE BEGINNING OF CONSTRUCTION.



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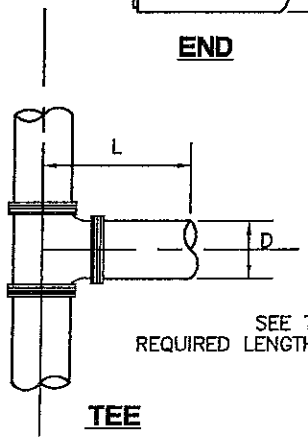
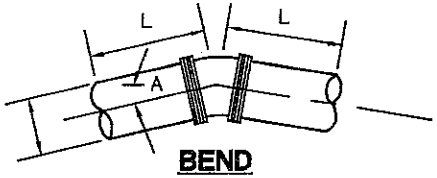


TEE

SEE TABLE FOR L,
REQUIRED LENGTH OF RESTRAINED JOINTS



BEND

REQUIRED LENGTH OF RESTRAINED JOINTS IN FEET									
	D–DIAMETER OF PIPE								
A = DEGREE OF DEFLECTION		4"	6"	8"	10"	12"	16"	20"	24"
	11 1/4°	1	1	1	2	2	2	3	3
	22 1/2°	1	2	3	3	4	5	6	7
	45°	3	4	5	6	8	10	12	15
	90°	7	10	13	16	19	24	30	33
	TEE	7	10	14	17	20	26	32	39
	END	7	10	14	17	20	26	32	39

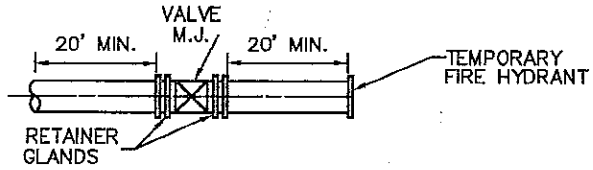
*REQUIRED RESTRAINED JOINT AT FITTING AND ONE BELL JOINT FROM FITTING MINIMUM.

REQUIRED LENGTH OF RESTRAINED JOINTS FOR WATER MAINS

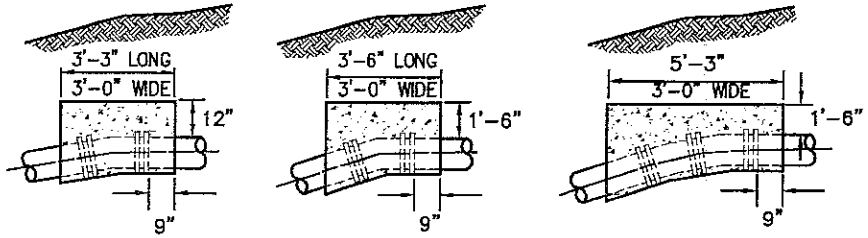
DESIGN PARAMETERS

LAYING CONDITIONS – TYPE 5
SOIL DESIGNATION – CLAY
DEPTH OF COVER – 4'
DESIGN PRESSURE – 80 PSI
SAFETY FACTOR – 1.50
BARE PIPE
IF WORST CONDITIONS EXIST, ADDITIONAL RESTRAINTS WILL BE NECESSARY.

MERCER COUNTY CHOICE ONE ENGINEERING	RESTRAINING JOINTS AND TAPPING SLEEVE FOR WATER MAINS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 300–2



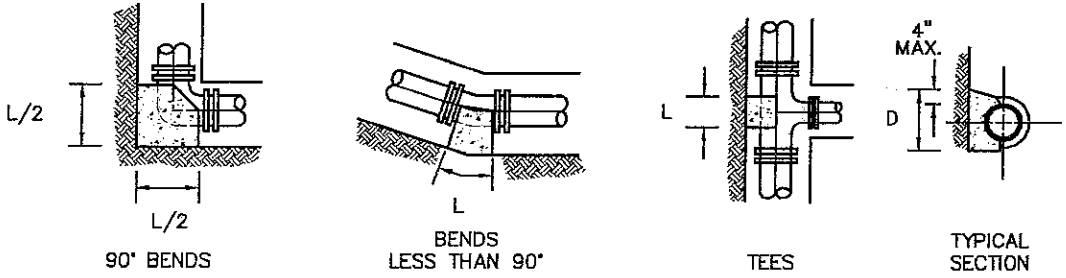
DETAIL - END OF WATER LINE



CONCRETE BLOCKING FOR VERTICAL BENDS

BENDS								
SIZE OF PIPE	DEGREE OF BEND							
	11 1/4°		22 1/2°		45°		90°	
	L	D	L	D	L	D	L	D
3", 4", 6"	8"	6"	10"	6"	20"	6"	36"	6"
8"	9"	8"	14"	8"	24"	9"	50"	8"
12"	14"	12"	22"	12"	30"	16"	60"	15"
16"	18"	16"	24"	18"	33"	36"	70"	22"

TEES								
RUN	BRANCH							
	3",4",6"		8"		12"		16"	
	L	D	L	D	L	D	L	D
3", 4", 6"	16"	6"						
8"	14"	8"	18"	12"				
12"	9"	12"	18"	12"	24"	18"		
16"	8"	16"	14"	16"	28"	16"	30"	26"



CONCRETE BLOCKING FOR HORIZONTAL BENDS

NOTES

A. CARE SHALL BE TAKEN TO KEEP CONCRETE AWAY FROM MECHANICAL JOINTS BY PLACING VISQUEEN OR OTHER APPROVED MATERIAL OVER PIPE BEFORE PLACING OF CONCRETE. BOLTS SHALL NOT BE ENCASED IN CONCRETE.

B. CONCRETE FOR BLOCKING VALVES AND FITTINGS SHALL CONFORM TO SECTION ODOT 499 CLASS C.

C. CONTRACTOR SHALL USE THE THRUST BLOCKS AS SHOWN ONLY IF PREAPPROVED FOR SPECIAL CONDITION BY THE VILLAGE PRIOR TO BEGINNING CONSTRUCTION.

MERCER COUNTY

CHOICE ONE ENGINEERING

CONCRETE BLOCKING FOR WATER MAINS

REVISIONS:

DATE APPROVED: JUNE 2000

PAGE No. 800-3

TRENCH DETAIL NOTES

A. BEDDING SHALL BE NATURAL SAND.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE COUNTY. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

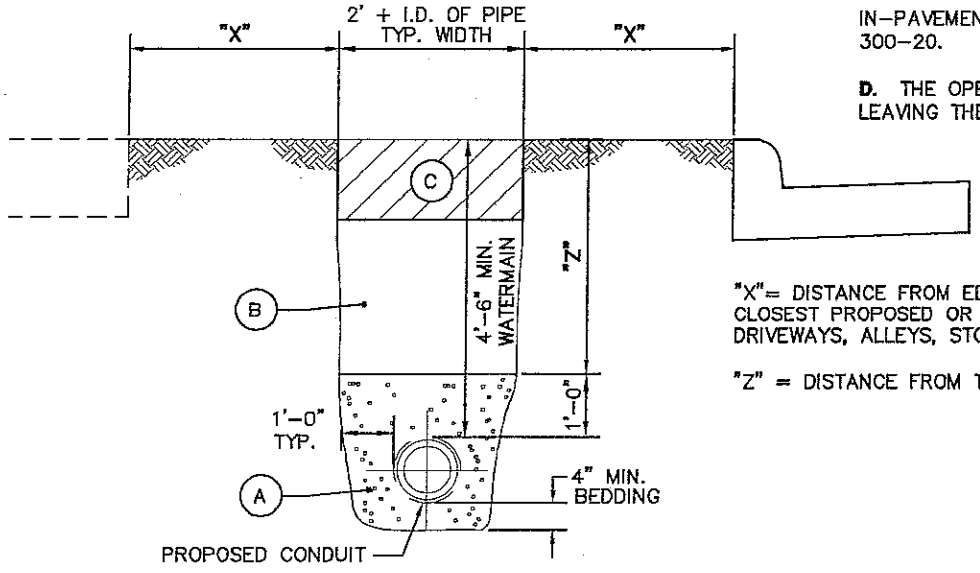
ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH GRANULAR BACKFILL MATERIAL ODOT 603 TYPE 1 OR TYPE 2, IN 6" MAXIMUM LIFTS OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED GRANULAR BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

A DENSITY TEST ON GRANULAR BACKFILL OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAYBE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE COUNTY.

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-20.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE COUNTY BEFORE LEAVING THE WORK FOR THE NIGHT.



"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.

TRENCH DETAIL

MERCER COUNTY CHOICE ONE ENGINEERING	**WATER MAIN TRENCH DETAIL**	REVISIONS:	DATE APPROVED: JAN. 2000 PAGE No. 300-4

MATERIAL SPECIFICATIONS

A. WATER MAIN SHALL BE AWWA C-151 DUCTILE IRON PIPE CLASS 52, SLIP-ON JOINTS WITH RUBBER GASKETS OR DR-18 CLASS 150, AWWA C-900 FOR 6" THROUGH 12" ONLY.

B. BELL JOINT RESTRAINTS - FOR PVC, USE EBAA IRON SERIES 1500 OR EQUIVALENT. FOR DIP, USE FIELD LOCK BY US PIPE OR APPROVED EQUIVALENT.

C. MECHANICAL JOINT RESTRAINTS - EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

D. FIRE HYDRANTS - MUELLER CENTURION A-423 OR CLOW 2500 CHALLENGER, MECHANICAL JOINT, WITH (2) 2 1/2" HOSE NOZZLES WITH NST, (1) 4 1/2" PUMPER NOZZLE, NATIONAL STANDARD THREADS CONFORMING TO AWWA, CCW TO OPEN, 6" SUPPLY PIPING WITH 6" MECHANICAL JOINT INLET.

E. GATE VALVES - AWWA C-509, RESILIENT WEDGE, NON-RISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN, WITH ARROW INDICATING OPEN DIRECTION.

F. VALVE BOXES - 3-PIECE CAST IRON 6" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.

G. DISINFECTION OR STERILIZATION OF NEW MAINS AND SERVICES, AS REQUIRED BY THE OEPA, SHALL BE COORDINATED THROUGH AND SUPERVISED BY THE SUPERINTENDENT OF THE WATER TREATMENT PLANT OR HIS DESIGNEE. THE SUPERINTENDENT RESERVES THE RIGHT TO REQUIRE STRICTER CHLORINE RESIDUAL REQUIREMENTS ON A CASE-BY-CASE BASIS.

HYDROSTATIC TEST

A. AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PIPE OR VALVED SECTION, SHALL BE SUBJECTED TO HYDROSTATIC PRESSURE AND LEAKAGE TEST. ALL WATER MAINS MUST BE HYDROSTATICALLY TESTED (AWWA C-600). THE TESTS MUST BE PERFORMED IN THE PRESENCE OF A REPRESENTATIVE OF THE COUNTY. THE LEAKAGE TEST PRESSURE SHALL BE NOT LESS THAN 150 PSI. THE DURATION OF THE LEAKAGE TEST SHALL NOT BE LESS THAN 2 HOURS. HYDROSTATIC PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP TAKING WATER FROM AN AUXILIARY SUPPLY. ALL PIPING MUST BE PROPERLY FILLED AND FLUSHED TO DISPEL ALL AIR BEFORE THE TEST IS MADE USING POTABLE WATER. TESTING REQUIREMENTS FOR FIRE SUPPRESSION SYSTEMS SHALL BE IN ACCORDANCE TO THE REQUIREMENT OF THE COUNTY.

B. LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.

C. NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE EXCEEDS THE LEAKAGE DETERMINED BY THE FOLLOWING FORMULA: $L = \frac{n\ D\ \sqrt{P}}{7400}$

WHERE: n = NUMBER OF PIPE JOINTS
D = PIPE DIAMETER
P = TEST PRESSURE
L = ALLOWABLE LEAKAGE PER HOUR

THE FOLLOWING TABLE REPRESENTS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR.

D. DURING THE HYDROSTATIC TEST, A THOROUGH EXAMINATION OF ALL PIPING, FITTINGS, VALVES, HYDRANTS, ETC. SHALL BE PERFORMED. LEAKING JOINTS SHALL BE TIGHTENED AND CRACKED OR OTHERWISE DEFECTIVE MATERIAL SHALL BE REMOVED AND REPLACED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

DISINFECTION

A. AFTER SATISFACTORY HYDROSTATIC TESTING, THE COMPLETED WATER WORK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C-651.

B. DISINFECTION OR STERILIZATION OF NEW MAINS, AS REQUIRED BY THE OEPA, SHALL BE COORDINATED THROUGH AND SUPERVISED BY THE SUPERINTENDENT OF THE WATER TREATMENT PLANT OR HIS DESIGNEE. THE SUPERINTENDENT RESERVES THE RIGHT TO REQUIRE STRICTER CHLORINE RESIDUAL REQUIREMENTS ON A CASE-BY-CASE BASIS.

C. MAINTAIN PIPES FREE OF DIRT AND FOREIGN MATTER DURING CONSTRUCTION BY DEWATERING TRENCH AND SEALING OPEN PIPE BARRELS. SWAB EACH LENGTH OF PIPE AS IT IS INSTALLED. UPON COMPLETION OF MAIN, ISOLATE MAIN SEGMENTS AND FLUSH PIPE AT 2 FPS VELOCITY.

D. STERILIZE MAIN IN ACCORDANCE WITH AWWA C-651. INJECT 3% TO 5% HYPOCHLORITE SOLUTION TO PROVIDE 50 TO 60 MG PER LITER CONCENTRATION IN MAIN. CHLORINE MAY BE PLACED IN EACH SECTION OF PIPE AT THE TIME OF INSTALLATION. SAMPLE WATER AT EACH HYDRANT OR IF NO HYDRANT IS AVAILABLE, AT A TAP IN THE PROPOSED LINE. ANALYZE SAMPLE USING DPD REAGENT TO VERIFY FREE CHLORINE CONCENTRATION. MAINTAIN CONCENTRATION IN MAIN FOR 24 HOURS. SAMPLE HYDRANTS AT COMPLETION OF STERILIZATION VERIFYING MINIMUM CHLORINE RESIDUAL OF 20 MG PER LITER.

E. FLUSH CHLORINE SOLUTION TO WASTE INTO SANITARY SEWER AT A CONTROLLED RATE, NOT TO EXCEED 25 GPM. IF CHLORINE RESIDUAL DROPS IN 10 MG PER LITER, FLUSH MAIN AT 2 FPS AND REPEAT STERILIZATION PROCEDURE.

F. WATER SAMPLES - PERFORM BACTERIOLOGICAL TEST PER AWWA C-651 WILL BE DRAWN AND PROCESSED BY THE COUNTY. IN THE EVENT OF DETECTION OF COLIFORM ORGANISM, REPEAT FLUSHINGS, STERILIZATION, AND SAMPLING OF MAINS UNTIL ACCEPTABLE TEST RESULTS ARE ACHIEVED. THIS IS TO BE PERFORMED PRIOR TO TRANSFER OF SERVICE.

ALLOWABLE LEAKAGE PER 1000 FT. (305M) OF PIPELINE (GPH+)

AVG. TEST PRESSURE (PSI) BAR	NOMINAL PIPE DIAMETER- INCHES											
	3	4	6	8	10	12	14	16	18	20	24	30
250(17)	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56
225(16)	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38
200(14)	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19
175(12)	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98
150(10)	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76

NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE COUNTY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE COUNTY.

B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE COUNTY.

C. THE MINIMUM LENGTH OF PIPE NIPPLES SHALL BE 18".

D. ALL CUSTOMERS SHALL MEET BACKFLOW PREVENTION REQUIREMENTS AS PER STATE OF OHIO, EPA REGULATIONS AND THE COUNTY.

E. ALL WATERLINE CONSTRUCTION SHALL FOLLOW THE COUNTY STANDARDS, OHIO DEPARTMENT OF TRANSPORTATION ITEM 638, AND AWWA STANDARDS WHICHEVER IS MORE RESTRICTIVE AS DETERMINED BY THE COUNTY.

F. OPERATION OF CITY FIRE HYDRANTS, VALVES, METERS, SERVICES, STOPS, AND ALL OTHER MECHANICAL INFRASTRUCTURE ITEMS IS STRICTLY PROHIBITED.

G. ALL WATER MAINS SHALL HAVE A MINIMUM DEPTH OF 4'–6" AND A MAXIMUM DEPTH OF 6'–0" FROM TOP OF PIPE TO SURFACE.

PIPE

A. ALL PIPE FITTINGS SHALL BE DUCTILE IRON.

B.

WATER MAIN MINIMUM SIZE UNLESS OTHERWISE APPROVED	
RESIDENTIAL	6"
COMMERCIAL	8"
INDUSTRIAL	12"
BASED ON A WATER MAIN DESIGN THE COUNTY MAY APPROVE A MINIMUM LESS THAN THOSE ABOVE	

C. ALL PIPE 6" THROUGH 12" SHALL BE PVC CLASS 150, DR–18, AWWA C–900 OR DIP, CLASS 52, AWWA C–151. ALL PIPES OVER 12" TO BE DIP, CLASS 52, AWWA C–151.

D. DEADENDS NOT PERMITTED UNLESS THEY ARE DEEMED NECESSARY BY THE CITY ENGINEERING DEPARTMENT AFTER A REVIEW OF A WATERMAIN DESIGN, WHEN APPROVED THEY SHALL BE TERMINATED WITH A FIRE HYDRANT AT THE END.

EXCAVATION AND PIPE LAYING

A. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE COUNTY BEFORE LEAVING THE WORK FOR THE NIGHT AND AT OTHER TIMES OF INTERRUPTION OF THE WORK.

FITTINGS, VALVES AND HYDRANTS

A. FITTINGS OR SPECIALS IN SIZES 2" THROUGH 48" SHALL CONFORM TO ALL REQUIREMENTS OF ANSI A–21.10 (AWWA C–153). FITTINGS AND SPECIALS 12" AND SMALLER SHALL BE CLASS 250. LARGER FITTINGS AND SPECIALS SHALL BE CLASS 150. FITTINGS AND SPECIALS SHALL HAVE MECHANICAL JOINTS AND SHALL BE DUCTILE IRON.

B.

MAXIMUM SPACING UNLESS OTHERWISE APPROVED		
	HYDRANTS	VALVES
SINGLE & TWO FAMILY RESIDENTIAL	500'	800'
INDUSTRIAL, COMMERCIAL & MULTI–FAMILY	300'	500'

C. ALL TEE'S AND CROSSES SHALL BE VALVED IN EACH DIRECTION UNLESS OTHERWISE APPROVED.

D. NO VALVE SHALL BE OPERATED BY PERSONNEL OTHER THAN A REPRESENTATIVE EMPLOYED BY THE COUNTY.

UTILITY STAKING

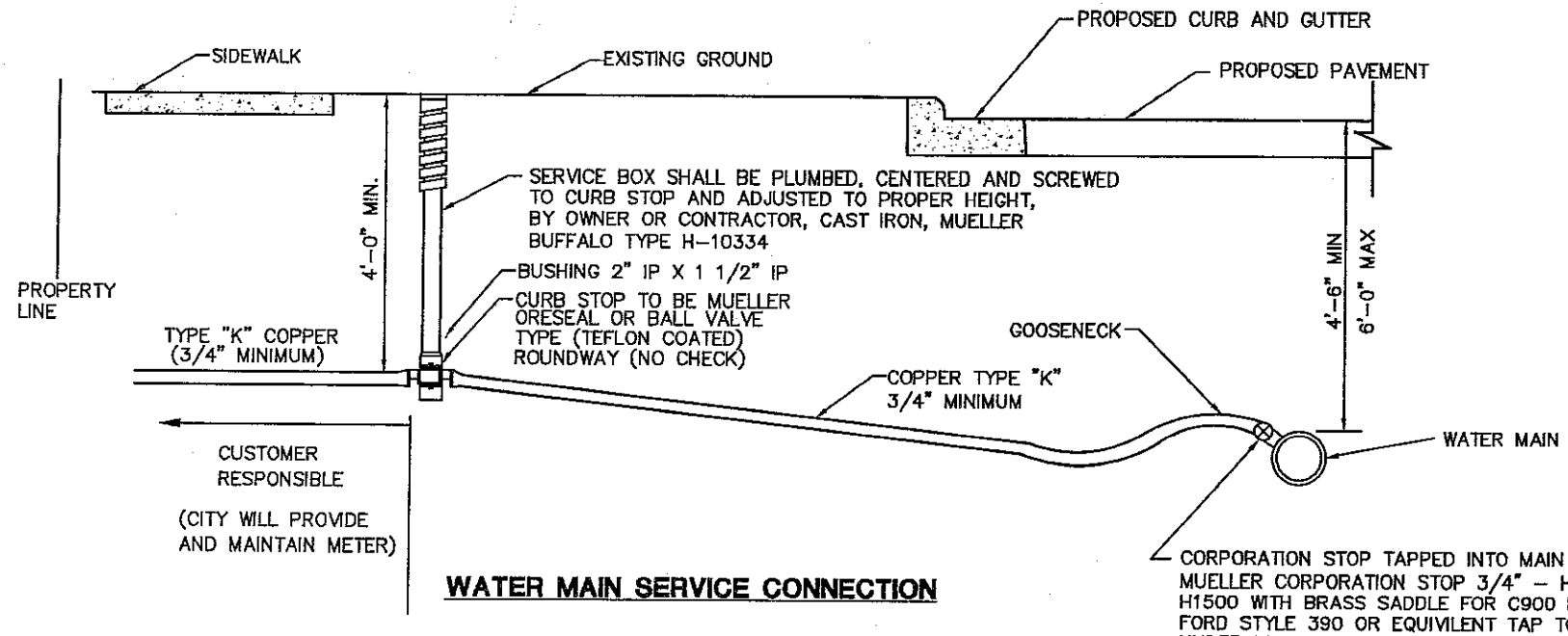
A. OFFSETS EVERY 25' ON CURVES. OFFSETS EVERY 100' ON STRAIGHT SECTIONS. FLOW LINE OF WATER MAIN (CUT) MARKED EVERY 100' WITH FINISHED GRADE AND OFFSETS SHALL BE CLEARLY MARKED.

TESTING

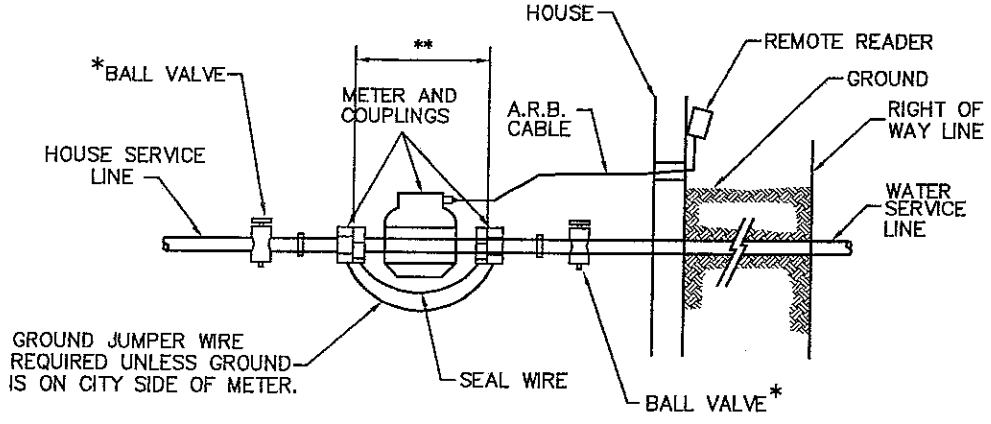
A. TESTING OF FIRE SUPPRESSION LINES AND SYSTEMS SHALL ADHERE TO THE REQUIREMENTS OF THE COUNTY AND ALL APPLICABLE STATE CODE.

BACKFLOW PREVENTION

A. BACKFLOW PREVENTING AND CROSS CONNECTION CONTROL SHALL CONFORM TO EPA STANDARD 3745–95.



WATER MAIN SERVICE CONNECTION



** A JUMPER SUPPLIED BY WATER DEPT. UPON REQUEST

INSIDE WATER METER

*A GATE VALVE IS REQUIRED ON EACHSIDE OF 1 1/2" AND LARGER SERVICE LINES

NOTES

A. WATER SERVICE SHALL BE SEAMLESS COPPER, TYPE K, MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION WW-T-799.

B. 1" SERVICE SHALL BE INSTALLED WHERE BUILDINGS ARE MORE THAN 120' FROM WATERMAIN OR WHERE REQUIRED BY PLANS.

C. WATER SERVICE SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN. WATER SERVICE MAY BE LAID ON BENCH IN THE SEWER LATERAL TRENCH IF CROWN IS A LEAST 18" BELOW INVERT OF WATER SERVICE, AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'-0".

D. METER UNIT FURNISHED BY CITY UNDER TAP FEE.

E. CORPORATION STOP AND CURB STOP ARE TO BE MUELLER OR EQUIVALENT.

F. ALL OTHER FITTINGS ARE TO BE BRASS, PLASTIC OR BY COUNTY ORDERS.

G. LOCATE WATER REMOTE READER AT LEAST 5' FROM ELECTRIC METER.

MERCER COUNTY CHOICE ONE ENGINEERING	# WATER MAIN SERVICE CONNECTIONS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800-7

NOTES

A. OUTSIDE METER PITS ARE DISCOURAGED. THIS TYPE OF INSTALLATION MAY BE USED ONLY WITH PRIOR APPROVAL BY WATER SUPERINTENDENT.

B. 20" I.D. TILE FOR FORD NO. W3 LID OR EQUIVALENT (1/2" X 5/8" METERS).

C. 24" I.D. TILE FOR FORD NO. W3 LIDAND No. 2 EXTENSION RING OR EQUIVALENT (1" METER).

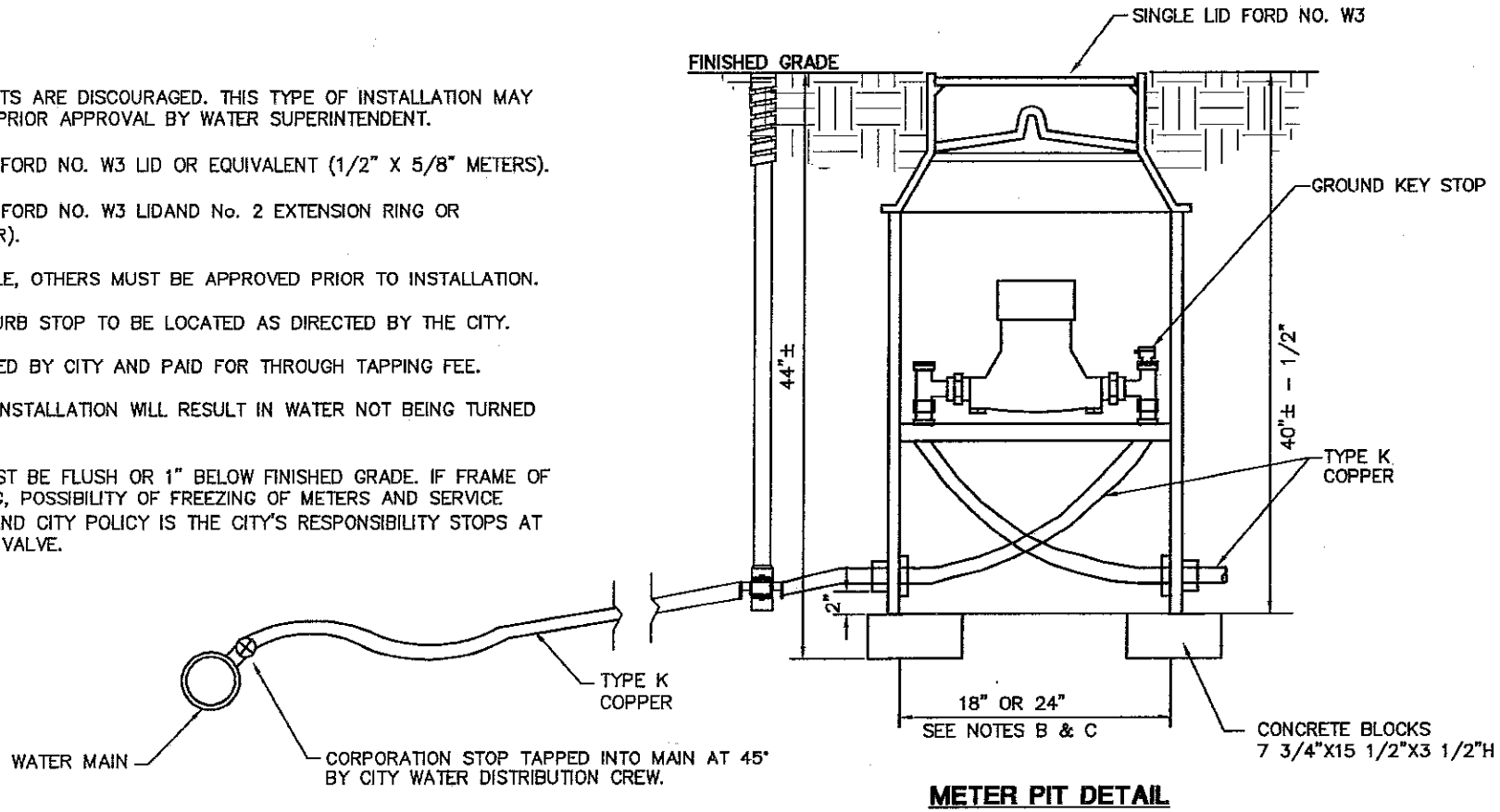
D. PLASTIC METER TILE, OTHERS MUST BE APPROVED PRIOR TO INSTALLATION.

E. METER PIT AND CURB STOP TO BE LOCATED AS DIRECTED BY THE CITY.

F. METER PIT PROVIDED BY CITY AND PAID FOR THROUGH TAPPING FEE.

G. UNSATISFACTORY INSTALLATION WILL RESULT IN WATER NOT BEING TURNED ON.

H. METER PIT LID MUST BE FLUSH OR 1" BELOW FINISHED GRADE. IF FRAME OF METER LID IS SHOWING, POSSIBILITY OF FREEZING OF METERS AND SERVICE LINES IS INCREASED AND CITY POLICY IS THE CITY'S RESPONSIBILITY STOPS AT THE FIRST SHUT-OFF VALVE.



METER PIT DETAIL

FORD CATALOG CORRERSETTER NO.	SERVICE PIPE SIZE	METER	SPREAD	TILE SIZE
V 71 – H*	3/4"	1/2" X 5/8"	7 7/8"	20" DIA.
V 74 – H*	1"	1"	11 1/8"	24" DIA.

*SUBSTITUTE DESIRED HEIGHT IN INCHES FOR "H"

MERCER COUNTY

CHOICE ONE ENGINEERING

METER PIT INSTALLATION

REVISIONS:

DATE APPROVED: JUNE 2000

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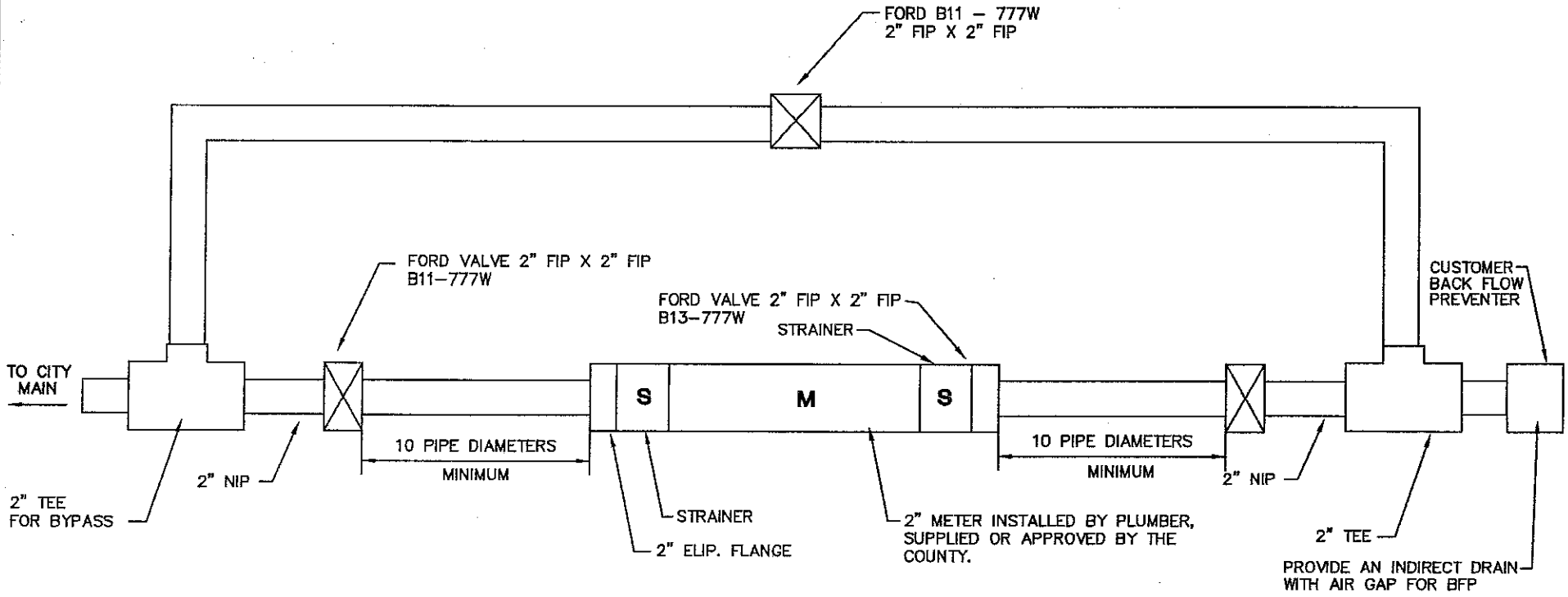


NOTES

A. METER MUST BE MOUNTED HORIZONTALLY.

B. APPLY NEVER SEIZE TO NUTS AND BOLTS.

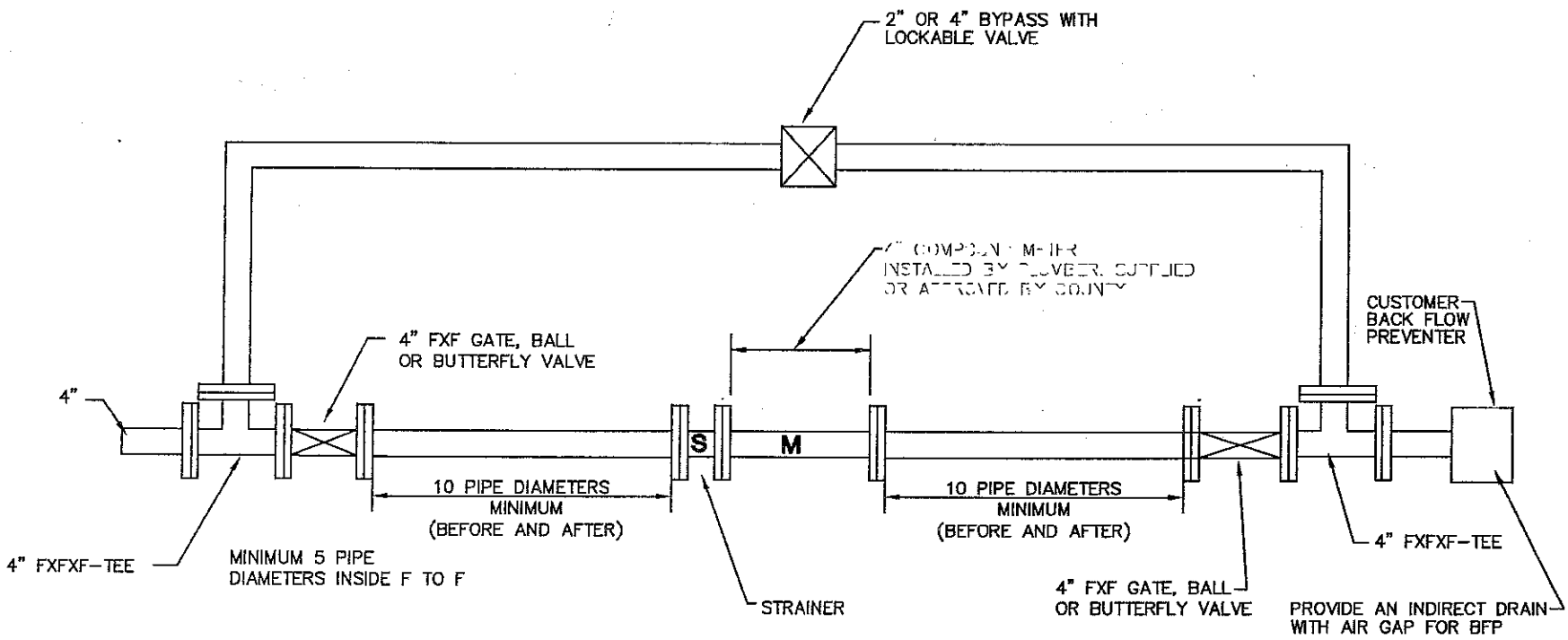
C. METER BYPASS ASSEMBLY AND METER SETTING TO BE CONSTRUCTED OF PVC SCH. 80, BRASS OR COPPER. NO FEMALE PVC THREADS PERMITTED.

D. ALL PIPING TO BE THOROUGHLY SUPPORTED.

E. THE CITY IS NOT RESPONSIBLE FOR MAINTENANCE OF INSIDE PLUMBING.

F. BACKFLOW PREVENTER CAN NOT BE BYPASSED.

MERCER COUNTY CHOICE ONE ENGINEERING	# 2" COMPOUND METER WITH BYPASS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800–9



NOTES

A. METER MUST BE MOUNTED HORIZONTALLY.

B. FULL FACE FLANGE GASKETS TO BE USED AND NEVER SEIZE APPLIED TO ALL NUTS AND BOLTS.

C. METER BYPASS ASSEMBLY AND METER SETTING TO BE CONSTRUCTED OF PVC SCH. 80, BRASS OR COPPER. NO FEMALE PVC THREADS PERMITTED.

D. ALL PIPING TO BE THOROUGHLY SUPPORTED.

E. THE COUNTY IS NOT RESPONSIBLE FOR MAINTENANCE OF INSIDE PLUMBING.

F. BACKFLOW PREVENTER CAN BE BYPASSED.

MERCER COUNTY CHOICE ONE ENGINEERING	# 4" COMPOUND METER WITH BYPASS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00-10

NOTES

A. FOR 4" AND GREATER SERVICES

B. PIPING SHALL BE D.I.P. CLASS 53 TO RIGID FLANGE. FROM RIGID FLANGE THROUGH METER VALVES AND BYPASS TO BE DUCTILE, COPPER OR BRASS.

C. FOR 1 1/2" AND 2" SERVICES: WATER DEPARTMENT RECOMMENDS THE USE OF COPPER PIPING

D. FULL PORT BALL VALVES IN LIEU OF VALVES MAY BE INSTALLED FOR 1 1/2" AND 2" METERS MUST BE LOCKABLE.

E. BYPASS MANDATORY FOR ALL METERS. BYPASS VALVE TO BE LOCKABLE.

F. DUAL INSTALLATION FOR BACKFLOW PREVENTION DEVICES IS OPTIONAL FOR 1 1/2" –2" METERS.

G. ALTERNATE DESIGNS MAY BE SUBMITTED TO WATER ENGINEERING FOR APPROVAL.

H. PROVIDE SPREADER DEVICE FOR PROPER ALIGNMENT ON INSTALLATION OF METER SPREAD.

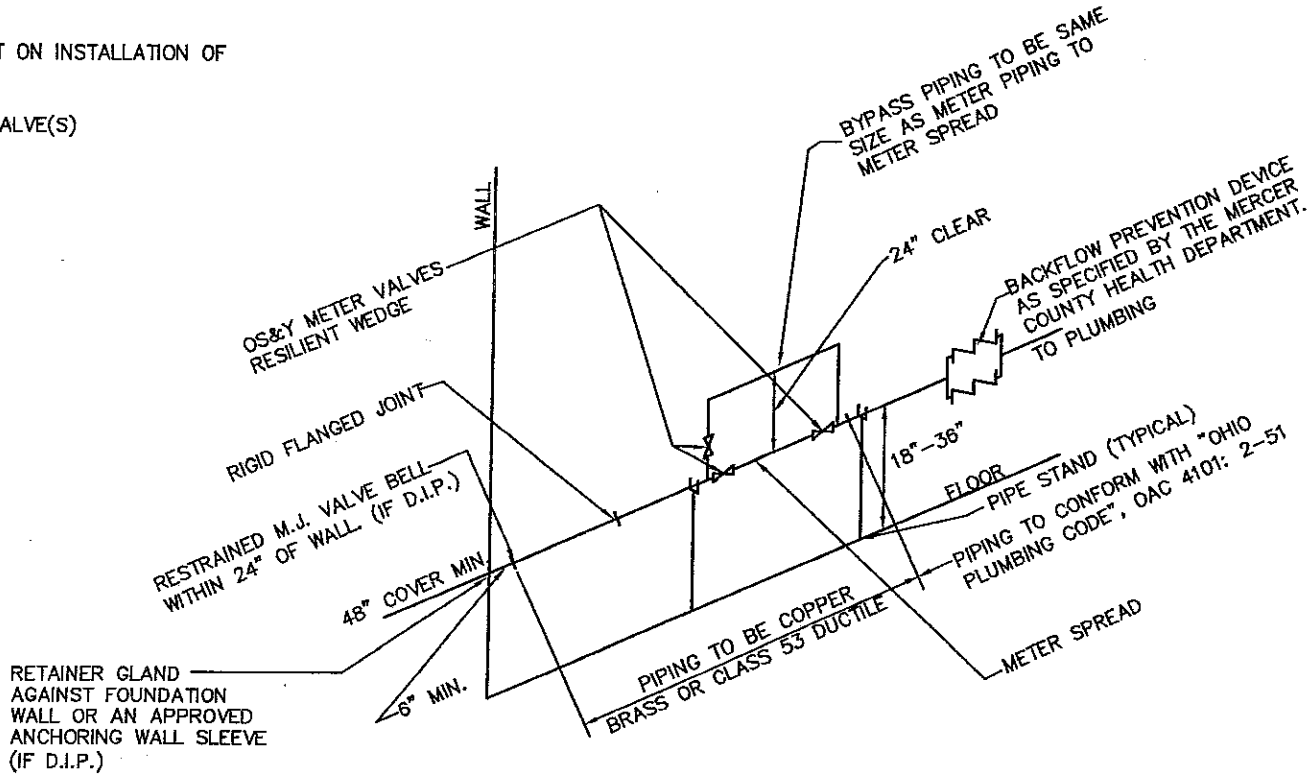
I. NO FLANGE ADAPTERS BEFORE INITIAL SHUT–OFF VALVE(S)

METER SPREAD (FACE TO FACE)

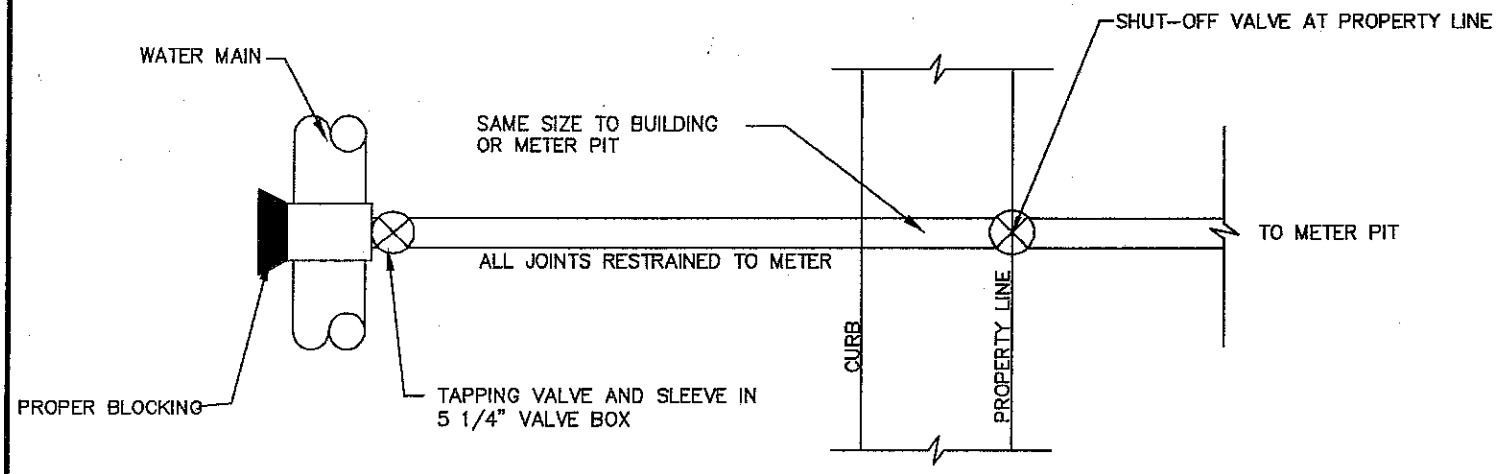
1 1/2"	28"	F.I.P.
2"	30"	FLANGED
3"	46"	FLANGED
4"	56"	FLANGED
5"	60"	FLANGED

8" AND LARGER TO BE REVIEWED BY THE COUNTY

(F.I.P.– FEMALE IRON PIPE THREAD)



MERCER COUNTY CHOICE ONE ENGINEERING	# TYPICAL LARGER METER LAYOUT IN BUILDING	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800–11

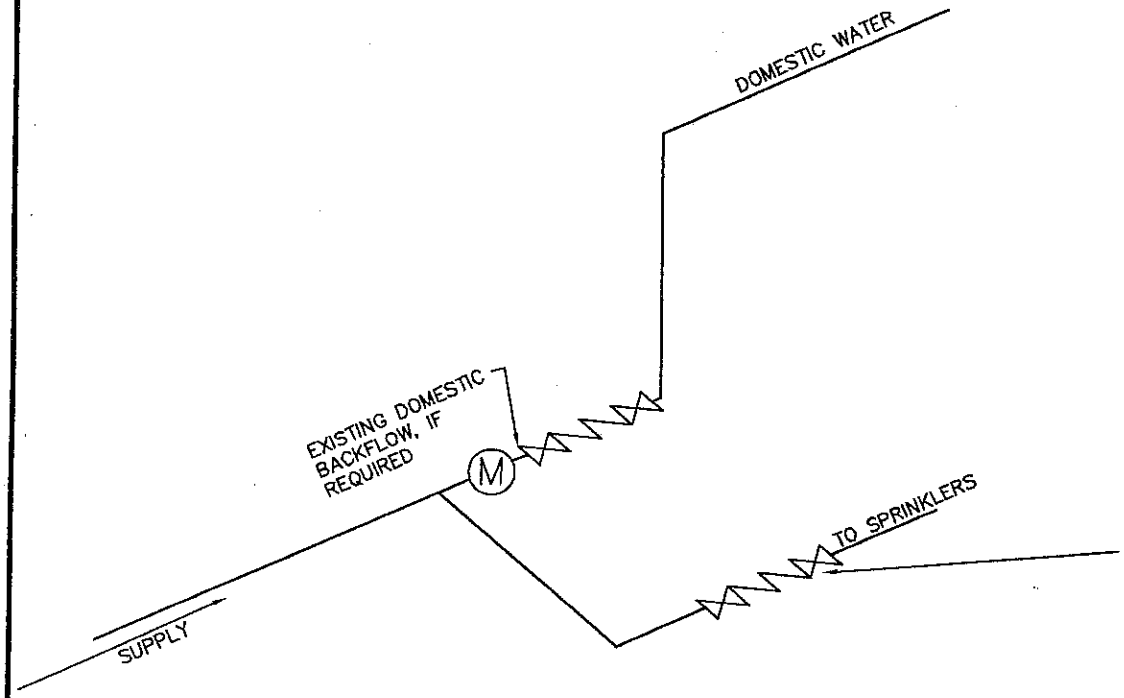


SERVICE TEES ARE PERMITTED IF:

A. SHOWN ON AN APPROVED SET OF CONSTRUCTION PLANS.

B. 4" MINIMUM BRANCH AND SERVICE LINE WITH GATE VALVE WITHIN 3' OF MAIN.

MERCER COUNTY CHOICE ONE ENGINEERING	# 4" AND LARGER WATER MAIN SERVICE CONNECTION (DOMESTIC)	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00-12



NOTE:

A. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEM WILL AFFECT ORIGINAL FLOW CALCULATION

1. TESTABLE DOUBLE CHECK VALVE (ASSE 1015) AT POINT OF CONNECTION TO DOMESTIC PIPING

2. LOCKABLE VALVES "SUPERVISED" PER OHIO BASIC BUILDING CODE 10:20

MERCER COUNTY

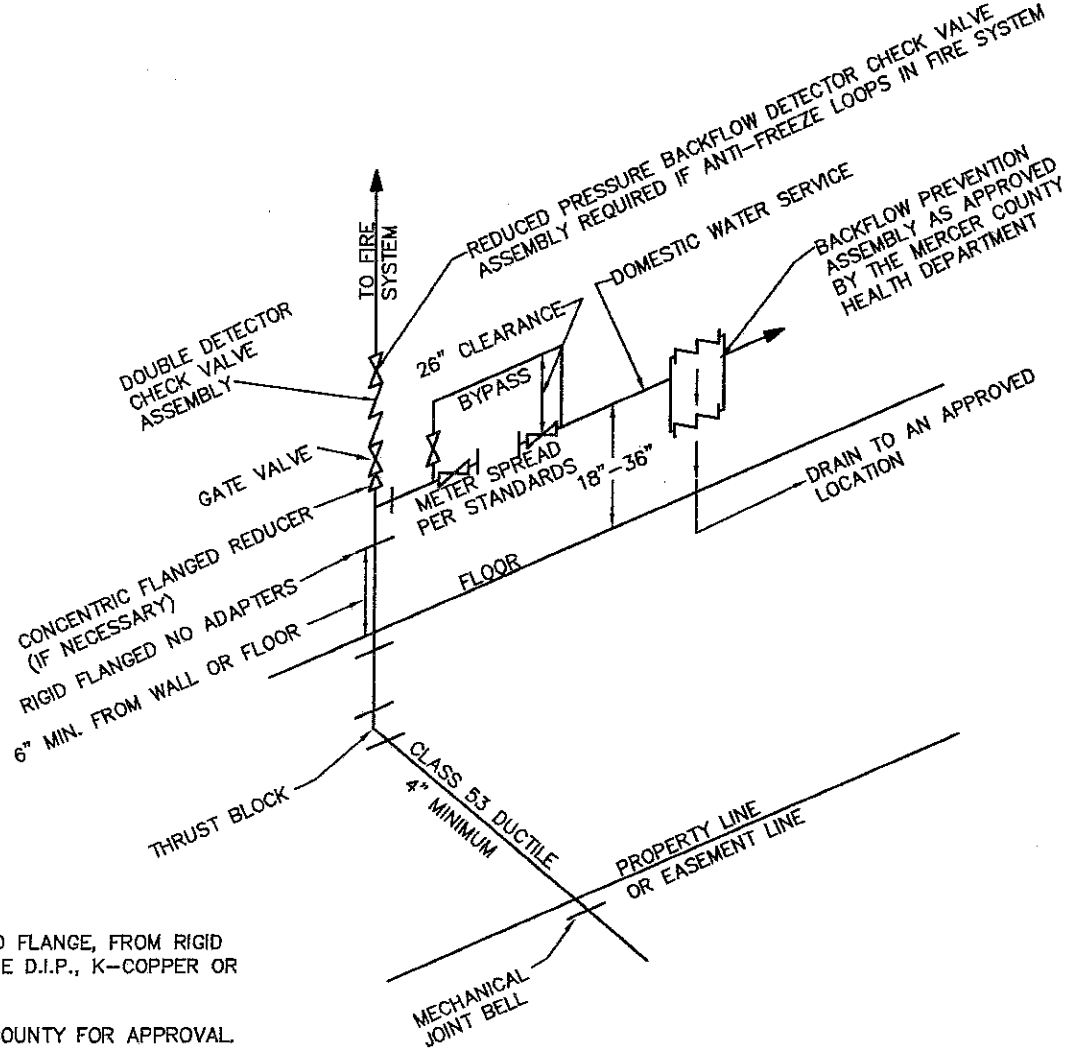
CHOICE ONE ENGINEERING

LIMITED AREA SPRINKLER SYSTEM DETAIL

REVISIONS:

DATE APPROVED: JUNE 2000

PAGE No. 800-13



NOTES

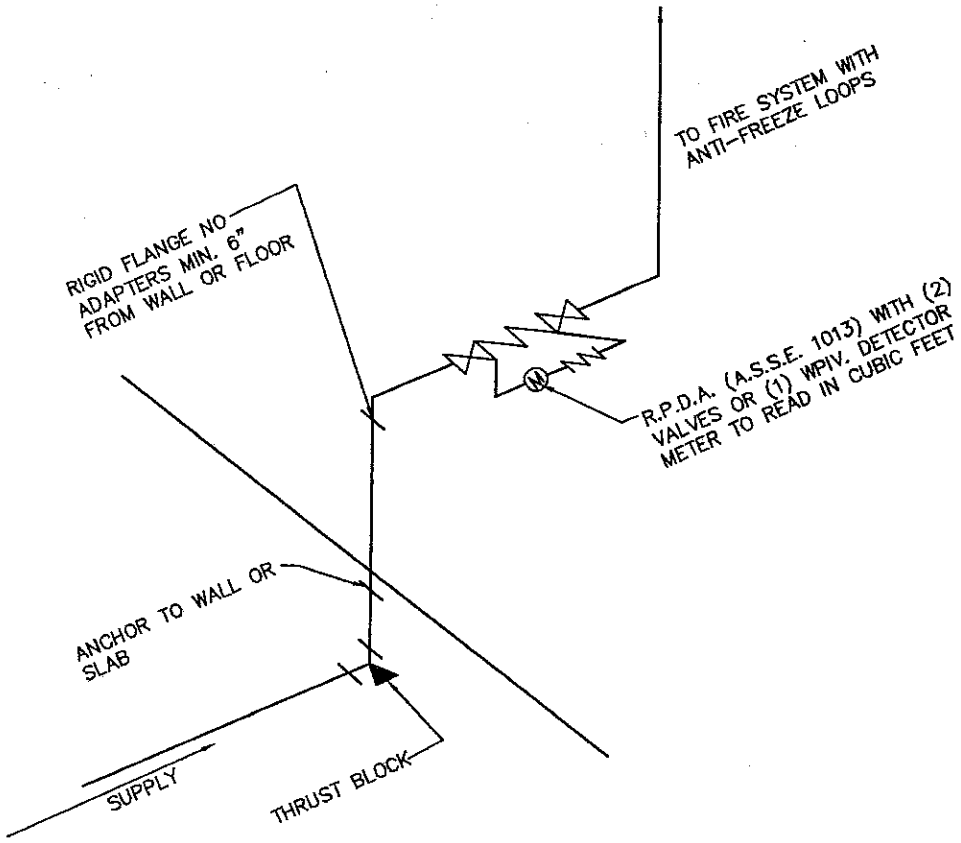
A. ALL UNDERGROUND JOINTS MUST BE RESTRAINED.

B. INSIDE PIPING SHALL BE D.I.P. CLASS 53 TO RIGID FLANGE, FROM RIGID FLANGE THROUGH METER VALVES AND BYPASS, TO BE D.I.P., K-COPPER OR BRASS.

C. ALTERNATE DESIGN MAY BE SUBMITTED TO THE COUNTY FOR APPROVAL.

D. SPLIT OF THE DOMESTIC SERVICE FROM MAIN SHALL BE WITHIN SAME ROOM OR WITHIN 200' WHICHEVER IS LESS.

MERCER COUNTY CHOICE ONE ENGINEERING	# COMBINATION FIRE AND DOMESTIC IN BUILDING	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00-14



NOTE:

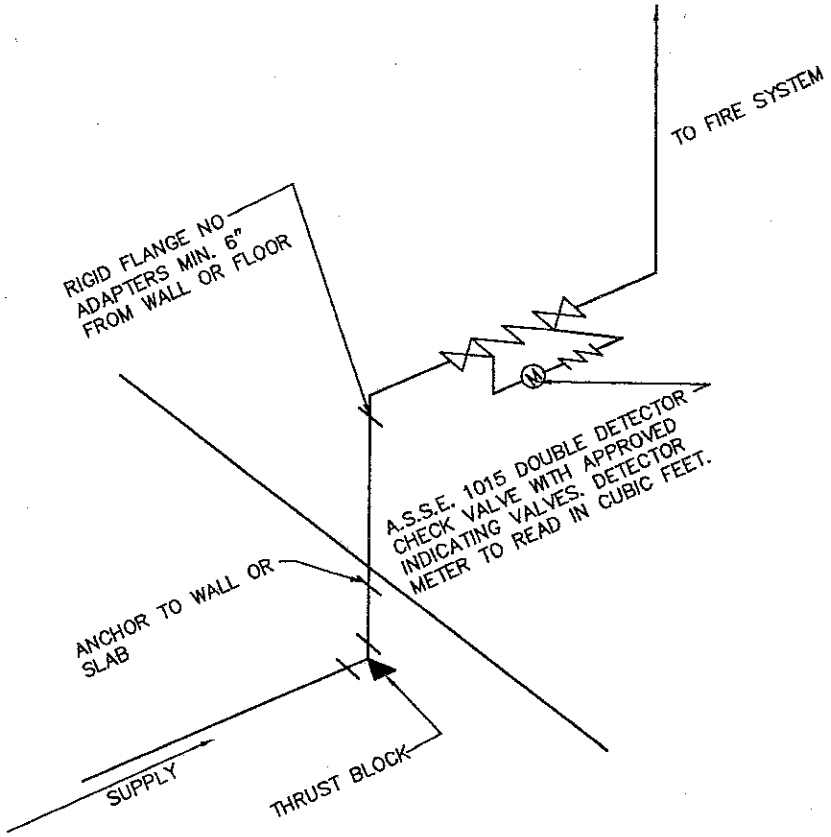
A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED

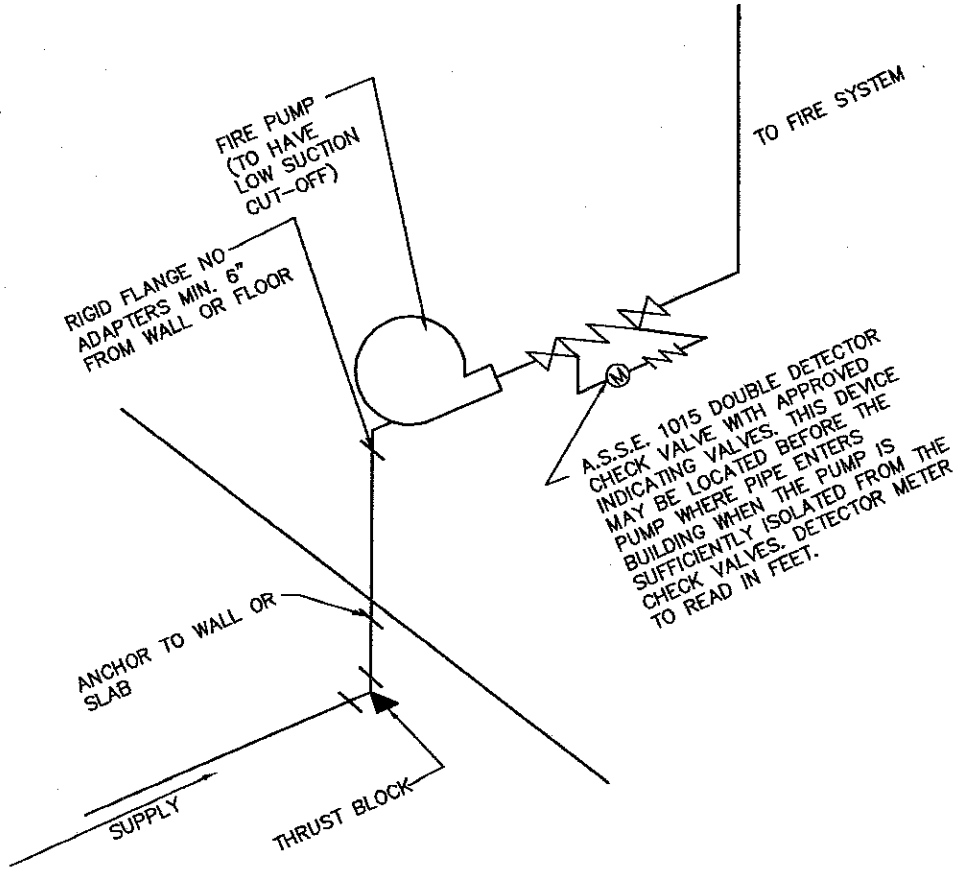
B. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEMS WILL AFFECT ORIGINAL FLOW CALCULATIONS

C. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED

D. A TEST AND REPORT SHALL BE SUBMITTED ANNUALLY TO WATER SUPERINTENDENT FOR ALL B.P.F.

MERCER COUNTY CHOICE ONE ENGINEERING	REDUCED PRESSURE DETECTOR ASSEMBLY	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800-15





NOTE:
A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED
B. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED
C. A TEST AND REPORT SHALL BE SUBMITTED ANNUALLY TO WATER SUPERINTENDENT FOR ALL R.P.D.

MERCER COUNTY	DOUBLE DETECTOR CHECK VALVE ASSEMBLY DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000
CHOICE ONE ENGINEERING			PAGE No. 00-16

NOTES

A. SEE SHEETS 800-6 AND 800-7 FOR TYPICAL NOTES

B. BACKFLOW PREVENTION DEVICE REQUIRED-CONTACT WATER SUPERINTENDENT FOR APPROVED DEVICE.

C. ALTERNATE DESIGNS MUST BE SUBMITTED FOR APPROVAL.

D. NO OUTLETS ARE ALLOWED BETWEEN METER AND THE BACKFLOW PREVENTER WITH THE EXCEPTION FOR DRAINAGE PURPOSES.

E. THE UNDERGROUND WATER SERVICE SHALL BE K-COPPER UP TO THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER. ALL JOINTS FLARED TYPE JOINTS.

F. IN CASE OF ADD-ON CONSTRUCTION (WITH AN EXISTING DOMESTIC METER AND SERVICE) LEAD FREE SOLDERED JOINTS WILL BE ACCEPTED AT THE TAKE-OFF TEE ONLY

G. THE INSTALLATION SHALL BE INSPECTED BY THE COUNTY.

INSTRUCTIONS FOR THE INSTALLATION OF IRRIGATION METERS AND BACKFLOW PREVENTERS FOR IRRIGATION

1. MAKE DRAWING OF THE PROPOSED IRRIGATION SYSTEM. THIS DRAWING MUST BE APPROVED BY THE CITY.

2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY.

3. GET THE NECESSARY PERMITS.

A) TAPPING FEE COUNTY
B) INSPECTION FEE $50.00

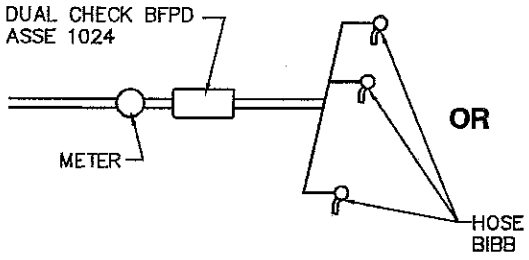
4. GET FORMS AT THE CITY FOR EACH BACKFLOW PREVENTER TO BE INSTALLED, PRIOR TO DOING THE WORK.

5. AFTER THE BACKFLOW PREVENTERS HAVE BEEN INSTALLED PLEASE FILL OUT THE FORMS COMPLETELY WITH THE OWNER/LESSE'S NAME, ADDRESS (WHERE THE BACKFLOW PREVENTER WAS INSTALLED), LOCATION OF THE BACKFLOW PREVENTER, SIZE, MAKE, MODEL, AND SERIAL NUMBER OF THE BACKFLOW PREVENTER. PLEASE RETURN THE COMPLETED FORMS TO THE COUTNY AND THE COUNTY HEALTH DEPARTMENT

6. CONTACT THE CITY AFTER THE WORK HAS BEEN COMPLETED. BACKFLOW PREVENTERS HAVE TO BE INSPECTED BY BOTH THE COUTNY AND THE COUNTY HEALTH DEPARTMENT

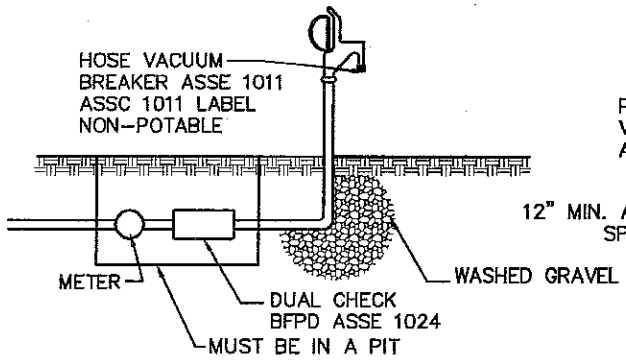
MERCER COUNTY CHOICE ONE ENGINEERING	STANDARD INSTALLATION FOR IRRIGATION METERS AND BACKFLOW PREVENTER	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 800-17

HOSE BIBB

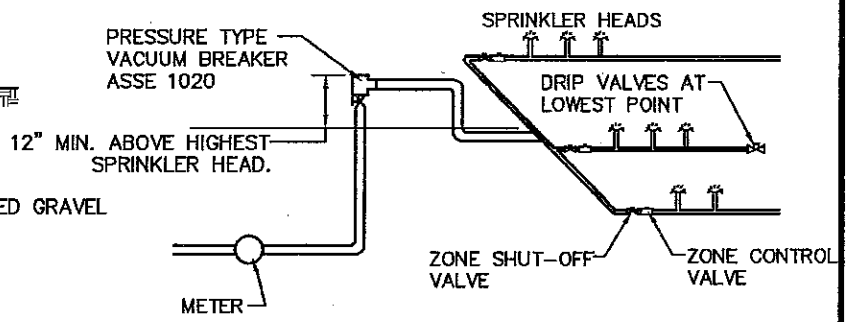


NON–RECERTIFIABLE BFPDS (ASSE 1001, ASSE 1011) ON HOSE BIBBS

YARD HYDRANT



SPRINKLER SYSTEM

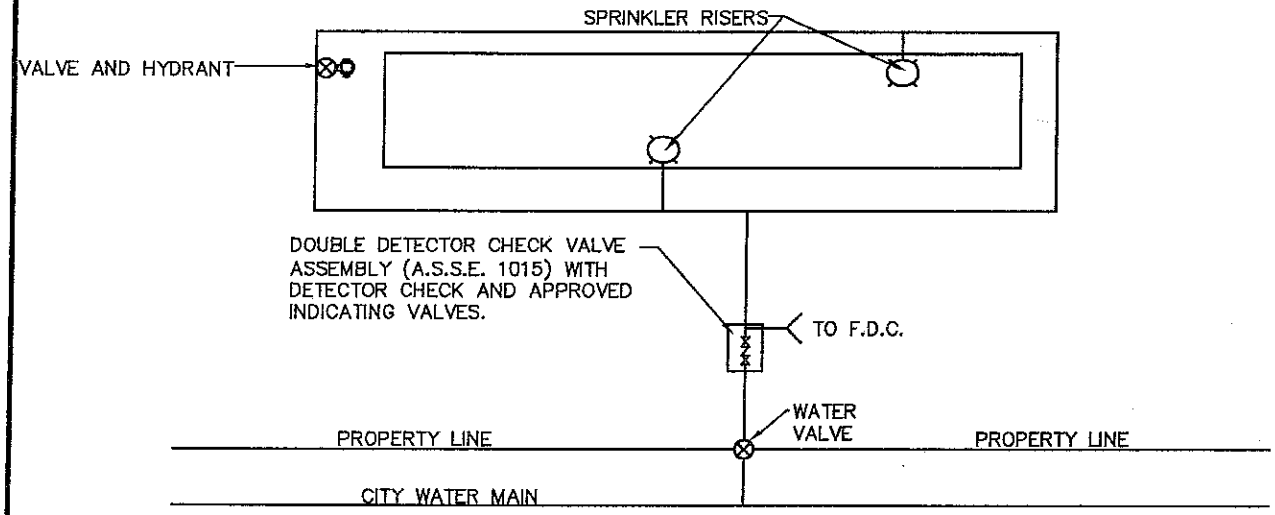


CONDITIONS

A. SHUT–OFF VALVES ARE ALLOWED DOWNSTREAM OF THE BFPD

B. THE PRESSURE TYPE VACUUM BREAKER MUST BE A MINIMUM OF 12" ABOVE THE HIGHEST SPRINKLER HEAD.

YARD MAIN SYSTEM ARRANGEMENT

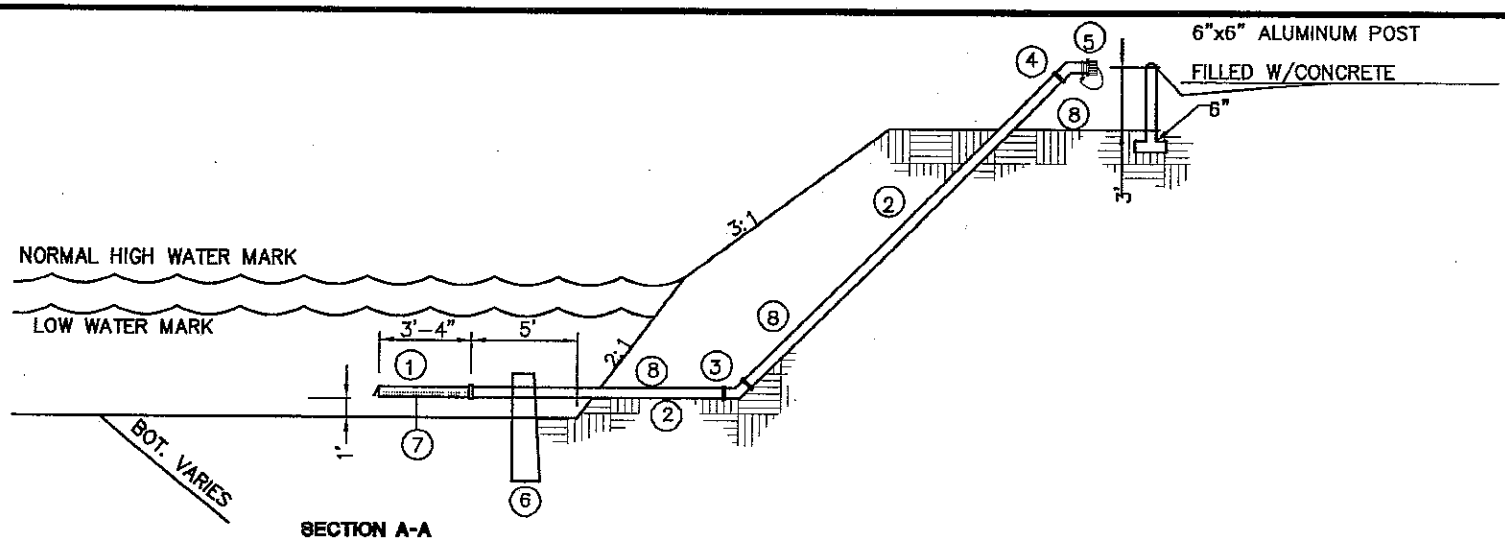


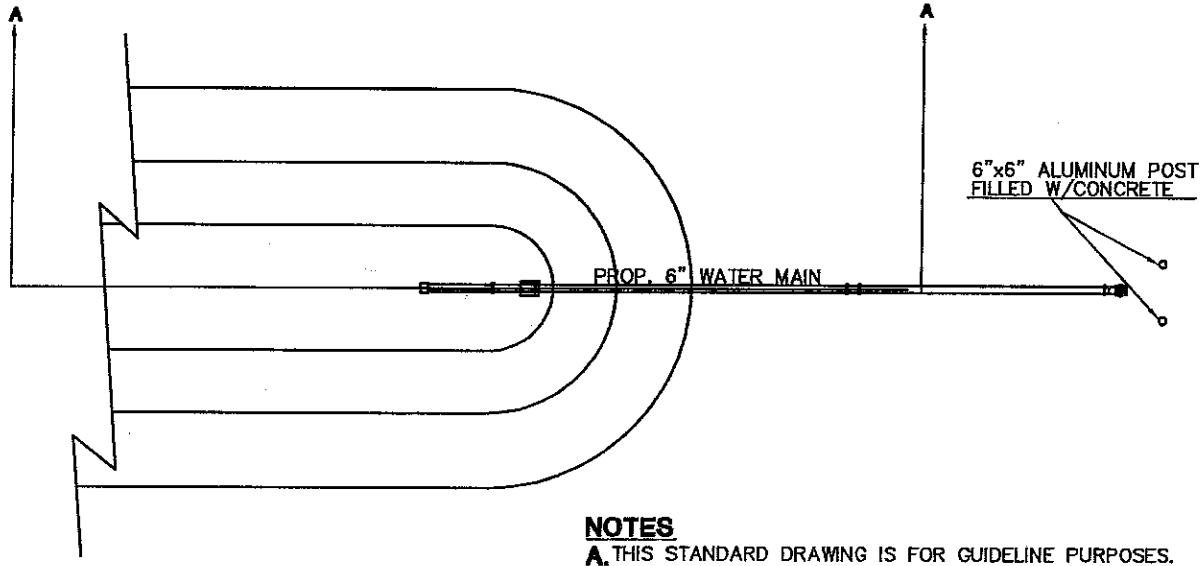
NOTES

A. A DRAWING OF EACH PROPOSED IRRIGATION SYSTEM MUST BE APPROVED BY THE COUNTY AND COUNTY HEALTH DEPARTMENT PRIOR TO CONSTRUCTION.

B. IF IRRIGATION SYSTEM IS NONE OF THE ABOVE, USE A REDUCED PRESSURE BACKFLOW PREVENTER, (ASSE 1013), AFTER THE WATER METER.

MERCER COUNTY CHOICE ONE ENGINEERING	**IRRIGATION DETAILS**	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–18





PLAN VIEW

ITEM	MATERIAL
①	6" PVC STRAINER W/BRASS CLAPPERED END CAP FOR EASY FLUSHING MAXI-FLOW DRY HYDRANT STYLE 133 OR EQUIVALENT
②	6" DIP PIPE – CLASS 52
③	6" DIP CLASS 52 ELBOW, 45° ELBOW
④	DRY HYDRANT ADAPTER 45° 6" ELBOW, WITH 5" PUMPER NOZZLE, WITH 6" SWIVEL FEMALE NATIONAL STANDARD THREAD ASSEMBLY
⑤	5" DRY HYDRANT CAP, WITH CABLE ATTACHED
⑥	ODOT H/W- 1 HEADWALL FOR 8" PIPE TO ALLOW FOR VERTICAL AND HORIZONTAL MOVEMENT
⑦	UNDERWATER SUPPORT FOR PVC STRAINER DARLEY #W409J OR EQUIVALENT
⑧	RESTRAINING GLANDS @ EACH 45° BEND 8" EACH WAY OF BEND

NOTES

A. THIS STANDARD DRAWING IS FOR GUIDELINE PURPOSES. EACH INDIVIDUAL DRY HYDRANT WILL NEED TO BE DESIGNED, DIMENSIONED AND SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.

DRY HYDRANT DETAIL

DESIGN 500 GPM FLOW NO SCALE

MERCER COUNTY

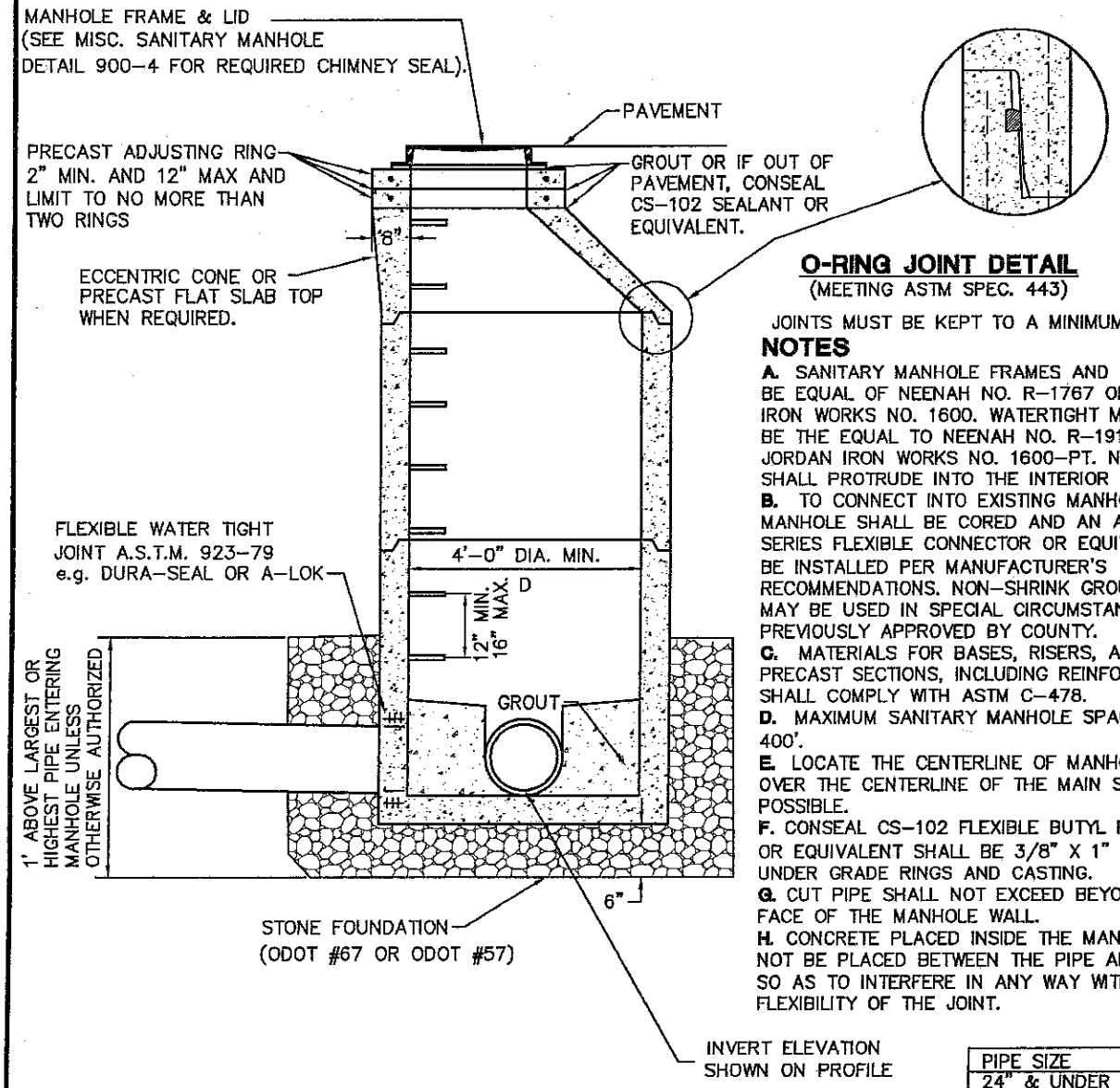
CHOICE ONE ENGINEERING

DRY HYDRANT FOR PONDS WITH STRAINER

REVISIONS:

DATE APPROVED: JUNE 2000

PAGE No. 800-19



O-RING JOINT DETAIL

(MEETING ASTM SPEC. 443)

JOINTS MUST BE KEPT TO A MINIMUM

NOTES

A. SANITARY MANHOLE FRAMES AND COVERS SHALL BE EQUAL OF NEENAH NO. R-1767 OR EAST JORDAN IRON WORKS NO. 1600. WATERTIGHT MANHOLES SHALL BE THE EQUAL TO NEENAH NO. R-1916-D OR EAST JORDAN IRON WORKS NO. 1600-PT. NO LATERALS SHALL PROTRUDE INTO THE INTERIOR MANHOLE.

B. TO CONNECT INTO EXISTING MANHOLE, THE MANHOLE SHALL BE CORED AND AN A-LOK XP SERIES FLEXIBLE CONNECTOR OR EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. NON-SHRINK GROUT ALTERNATIVE MAY BE USED IN SPECIAL CIRCUMSTANCES WHEN PREVIOUSLY APPROVED BY COUNTY.

C. MATERIALS FOR BASES, RISERS, AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENTS SHALL COMPLY WITH ASTM C-478.

D. MAXIMUM SANITARY MANHOLE SPACING SHALL BE 400'.

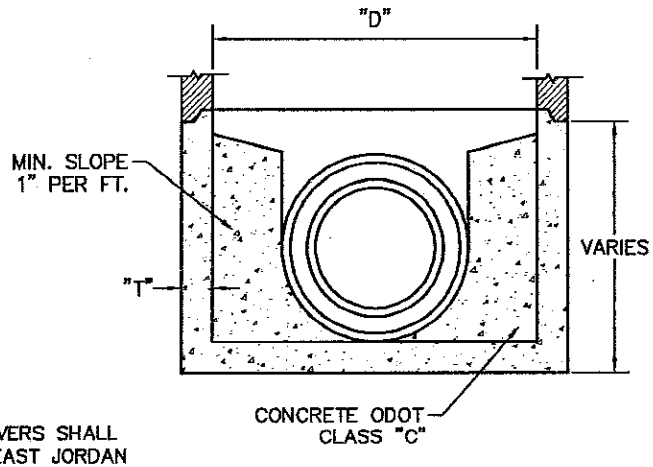
E. LOCATE THE CENTERLINE OF MANHOLE COVERS OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

F. CONSEAL CS-102 FLEXIBLE BUTYL RESIN SEALANT OR EQUIVALENT SHALL BE 3/8" X 1" MINIMUM STRIPS UNDER GRADE RINGS AND CASTING.

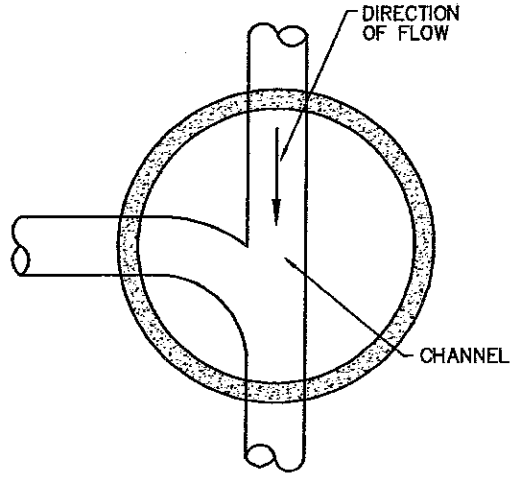
G. CUT PIPE SHALL NOT EXCEED BEYOND THE INSIDE FACE OF THE MANHOLE WALL.

H. CONCRETE PLACED INSIDE THE MANHOLE SHALL NOT BE PLACED BETWEEN THE PIPE AND THE OPENING SO AS TO INTERFERE IN ANY WAY WITH THE FLEXIBILITY OF THE JOINT.

PIPE SIZE	T	D
24" & UNDER	5"	48"
27" & ABOVE	6"	60"



PRECAST BASE SECTION



STANDARD INVERT CHANNEL

ALL INVERTS TO BE CHANNELED FOR OPTIMUM FLOW.

MERCER COUNTY

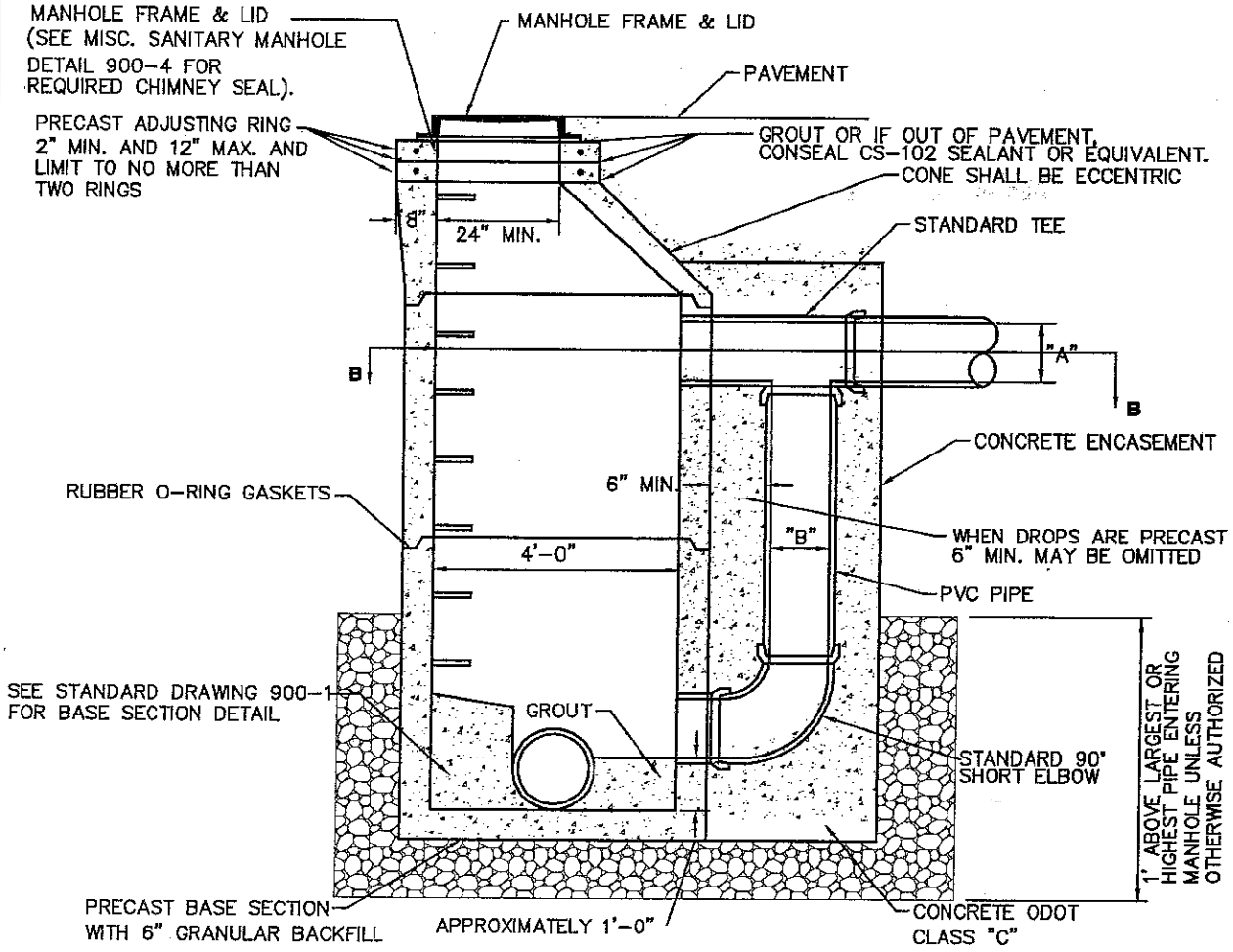
CHOICE ONE ENGINEERING

TYPE 3 SANITARY MANHOLE

REVISIONS:

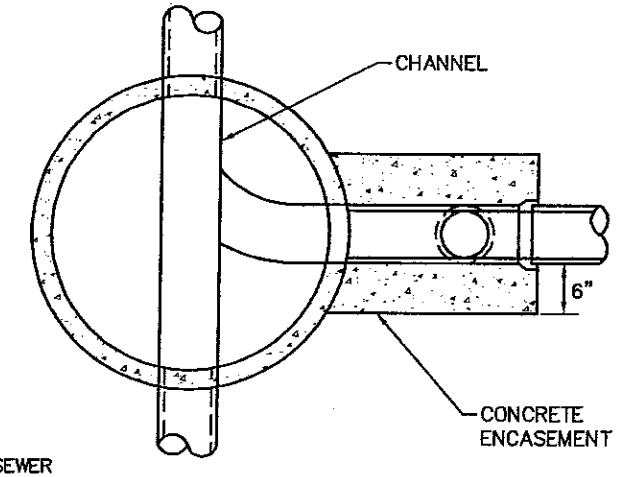
DATE APPROVED: JUNE 2000

PAGE No. 900-1



"A"	"B"
8", 10", & 12"	8"
15" & 18"	10"
21" & 24"	12"

DROP CONNECTION MANHOLE



SECTIONAL PLAN B-B

NOTES

A. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

B. TYPE D MANHOLE SHALL BE USED WHERE THE DIFFERENCE IN INVERT ELEVATIONS IS GREATER THAN 2'-0".

C. ALL NOTES AND ASTM REFERENCES ON THE TYPE 3 SANITARY MANHOLE APPLY ON THE TYPE D SANITARY DROP MANHOLE.

MERCER COUNTY

CHOICE ONE ENGINEERING

TYPE D SANITARY DROP MANHOLE

REVISIONS:

DATE APPROVED: JUNE 2000

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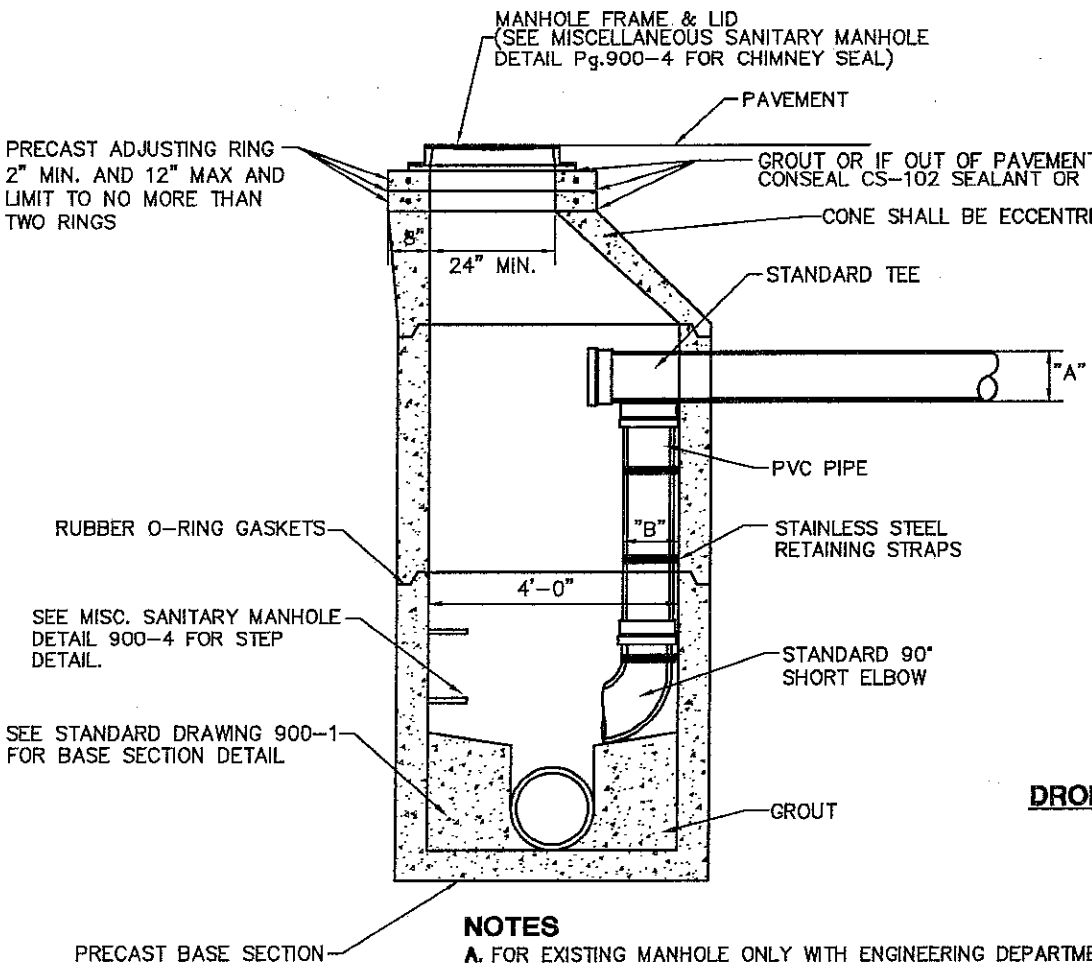


"A"	"B"
8", 10", & 12"	8"
15" & 18"	10"
21" & 24"	12"

DROP CONNECTION MANHOLE

NOTES

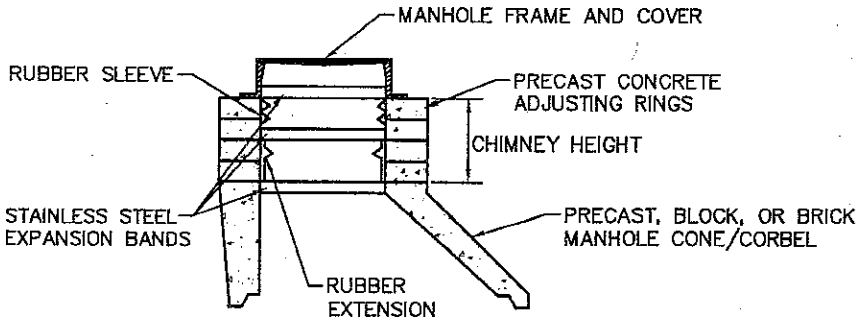
A. FOR EXISTING MANHOLE ONLY WITH ENGINEERING DEPARTMENT APPROVAL.

B. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

C. INSIDE DROP MANHOLE SHALL BE USED WHERE THE DIFFERENCE IN INVERT ELEVATIONS IS GREATER THAN 2'0" AND ONLY IN SPECIAL CIRCUMSTANCES WHEN PRE-APPROVED BY MERCER COUNTY.

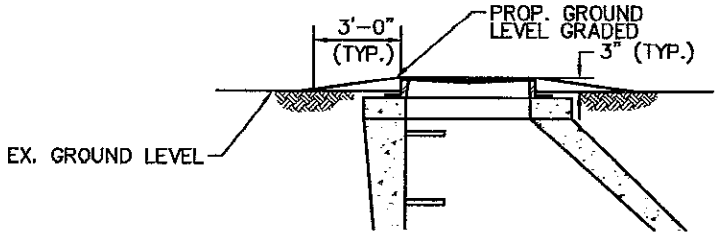
D. ALL NOTES AND ASTM REFERENCES ON THE TYPE 3 SANITARY MANHOLE APPLY ON THE INSIDE DROP SANITARY MANHOLE.

MERCER COUNTY CHOICE ONE ENGINEERING	# INSIDE SANITARY DROP MANHOLE	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-3

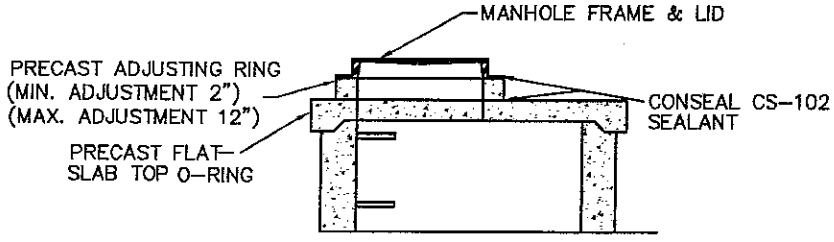


INTERNAL MANHOLE CHIMNEY SEAL

(REQUIRED FOR ALL SANITARY SEWER MANHOLES)



TYPICAL MANHOLE GRADING



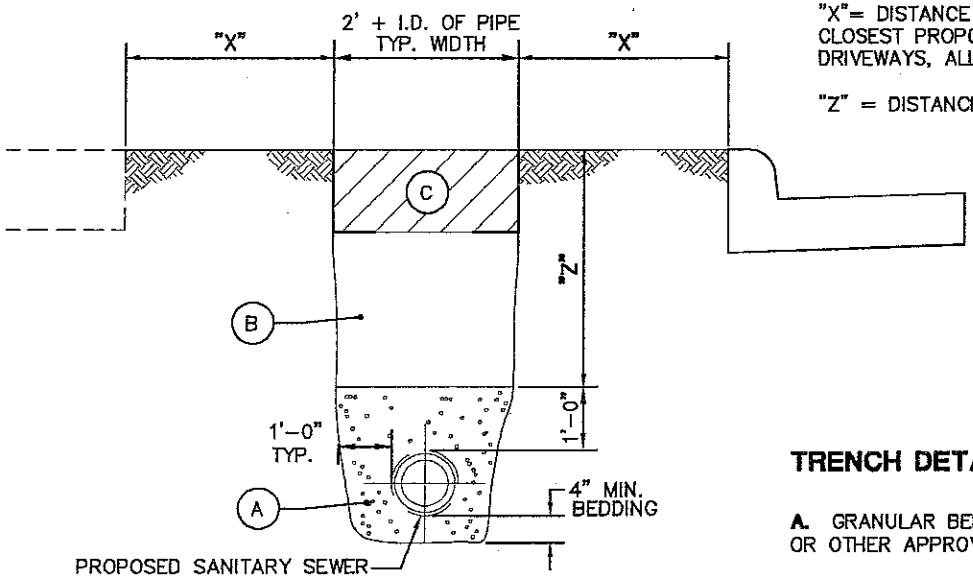
FLAT TOP SLAB

NOTES

A. MANHOLE STEPS SHALL BE SECURLY INSTALLED INTO EACH MANHOLE SECTION, BY THE MANUFACTURER, PRIOR TO DELEVERY TO THE JOB SITE

B. MANHOLE STEPS SHALL BE PF-1 STEP BY M.A. INDUSTRIES OR EQUVILENT

MERCER COUNTY CHOICE ONE ENGINEERING	MISCELLANEOUS SANITARY MANHOLE DETAILS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-4



SANITARY SEWER TRENCH DETAIL

"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.

TRENCH DETAIL NOTES

A. GRANULAR BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #67), OR OTHER APPROVED EQUIVALENT.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE COUNTY. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

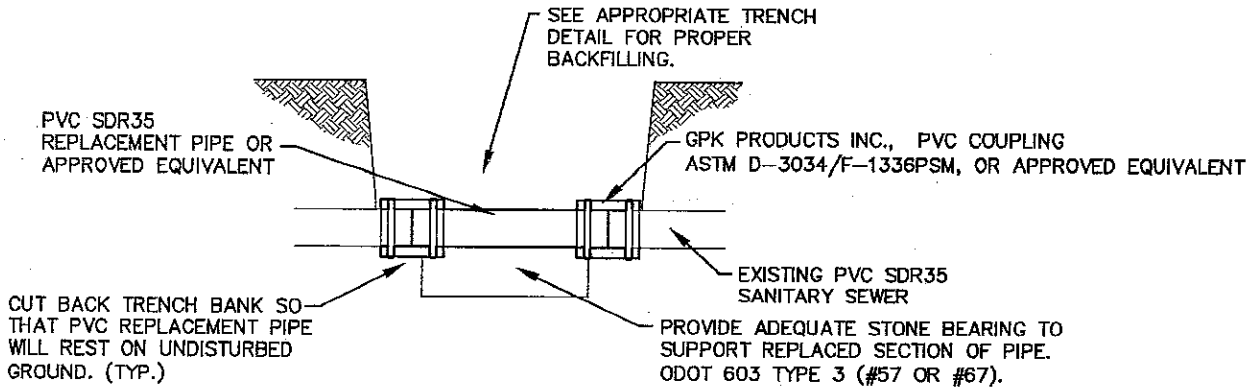
ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FOR PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH GRANULAR BACKFILL MATERIAL ODOT 603 TYPE 1 OR TYPE 2, IN 6" MAXIMUM LIFTS OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED GRANULAR BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

A DENSITY TEST ON GRANULAR BACKFILL OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAYBE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE COUNTY.

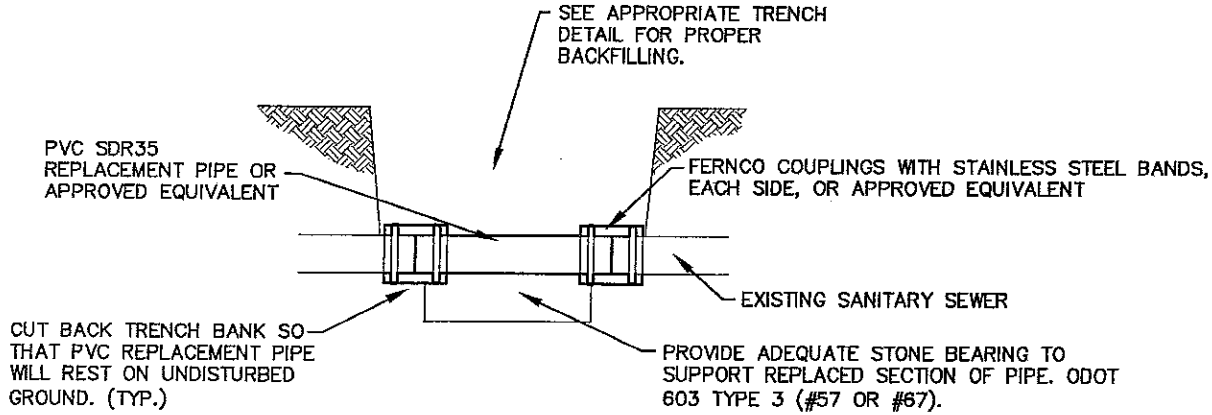
C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-18.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE COUNTY BEFORE LEAVING THE WORK FOR THE NIGHT.



REPAIR OF EXISTING PVC SDR35 SANITARY SEWER



REPAIR OF EXISTING SANITARY SEWER OTHER THAN PVC

MERCER COUNTY CHOICE ONE ENGINEERING	# REPAIR OF EXISTING SANITARY SEWER PIPE DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-6

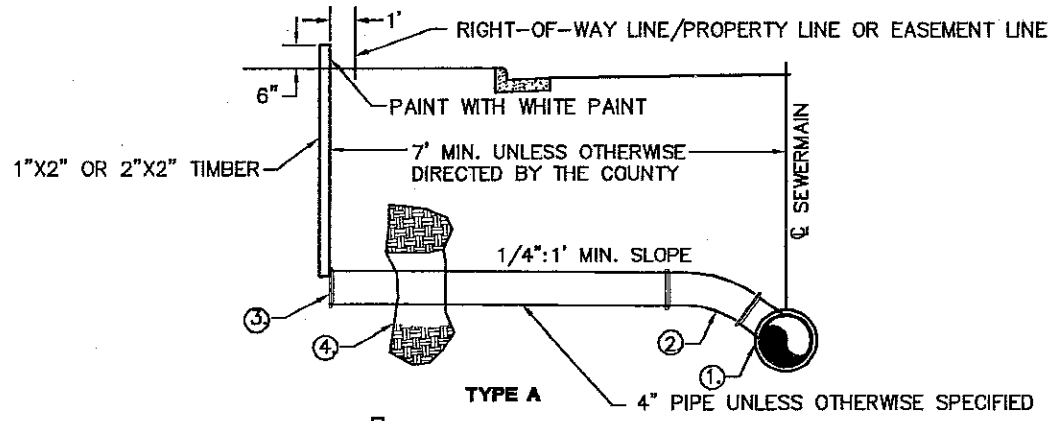
NOTES

A. RISER PIPE TO BE BEDDED SOLIDLY AGAINST UNDISTURBED GROUND. ALSO, TEE MAY BE SUBSTITUTED FOR WYE BRANCH IF SPECIFIED.

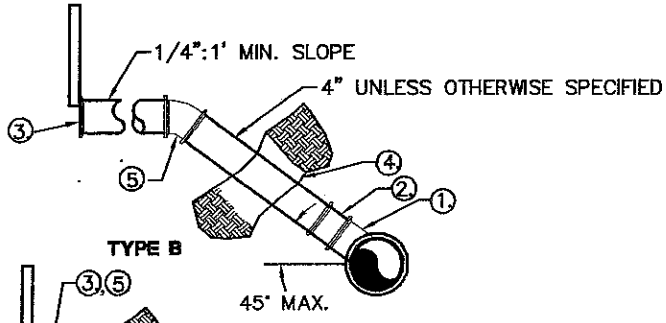
B. RISER PIPE TO BE INSTALLED SO THAT CONNECTING SERVICE SHALL HAVE A MINIMUM DEPTH OF 7' AT THE PROPERTY LINE UNLESS OTHERWISE DIRECTED BY THE COUNTY.

C. CONCRETE ENCASEMENT AND BLOCKING REQUIRED IF DEPTH OF CONNECTION IS 12' OR GREATER.

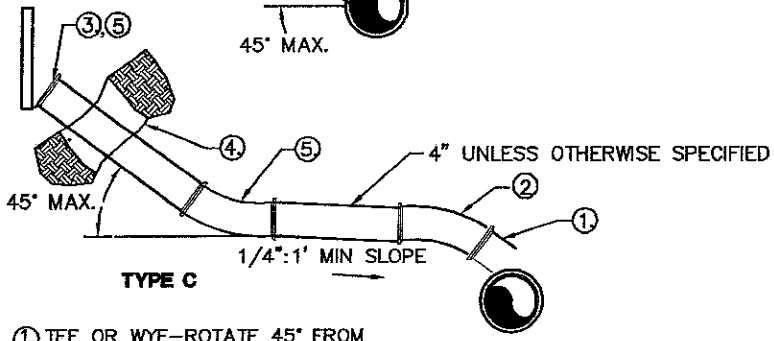
D. EACH SANITARY LATERAL MUST BE IN SEPARATE TRENCHES.



TYPE A

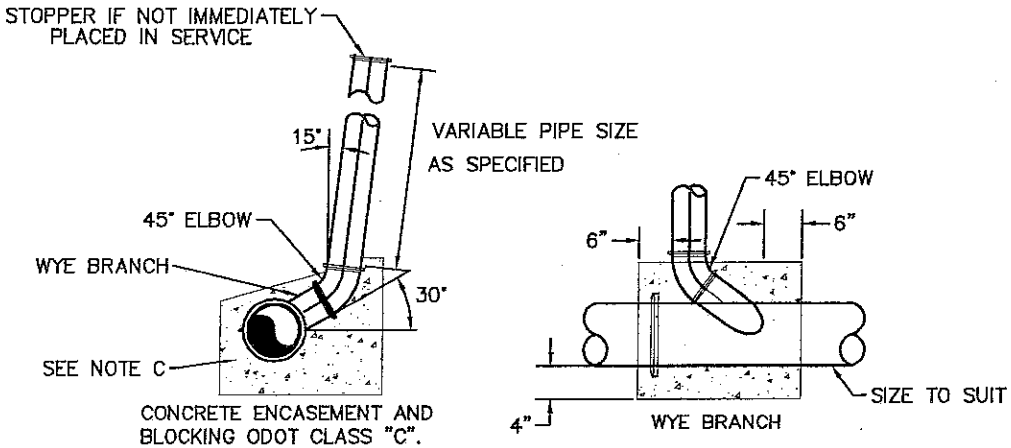


TYPE B



TYPE C

1. TEE OR WYE–ROTATE 45° FROM HORIZONTAL UNLESS OTHERWISE SPECIFIED.
2. 1/8 BEND OR 1/16 BEND AS NEEDED.
3. CAP UNLESS JOINING EXISTING SERVICE LATERAL.
4. BED PIPE WITH 8" GRANULAR MATERIAL AND BACKFILL WITH GRANULAR MATERIAL TO 8" ABOVE PIPE. ODOT 603 TYPE 3 #57 OR #67.
5. EXACT RECORD OF CAP LOCATIONS MUST BE MADE, AS PER 900–12 OF THESE STANDARDS.



SERVICE RISER

SERVICE LATERAL

MERCER COUNTY

CHOICE ONE ENGINEERING

SERVICE RISER AND SERVICE LATERAL

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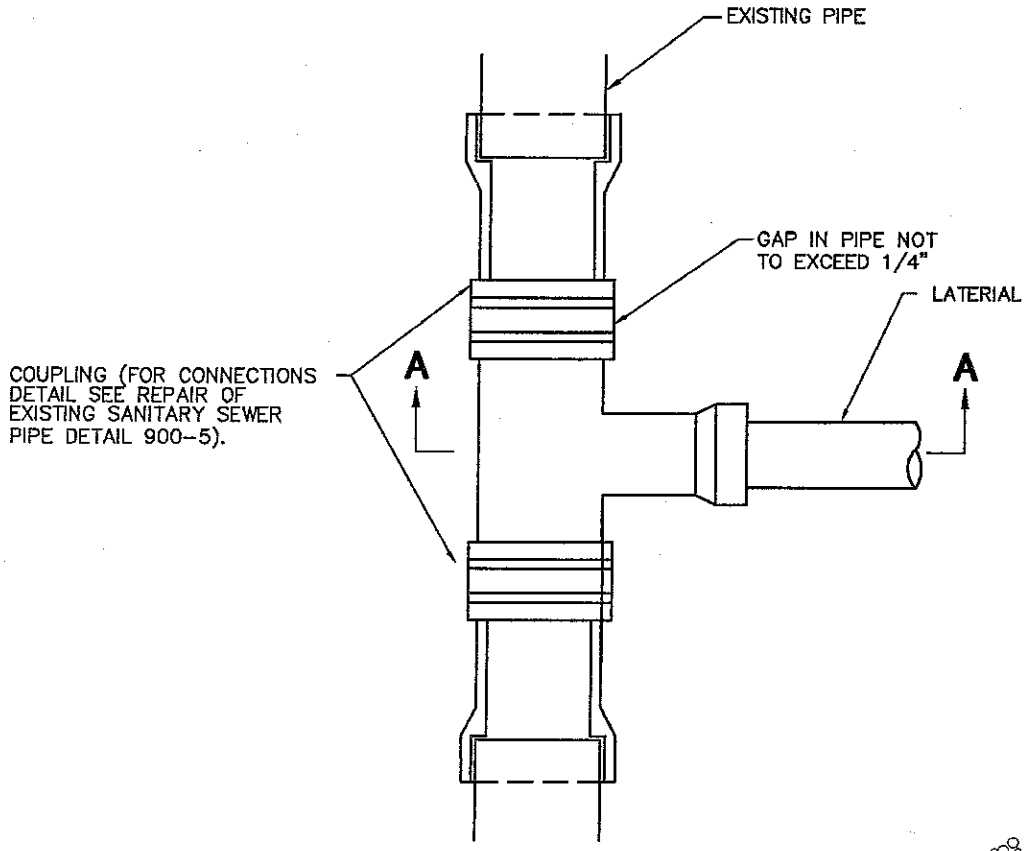
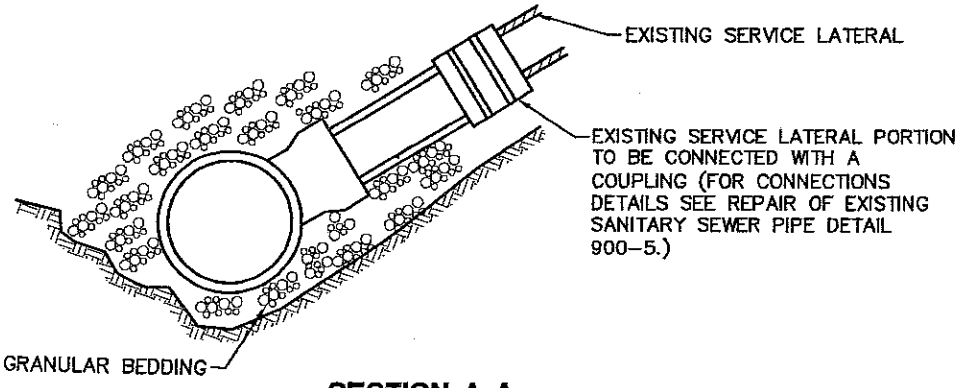


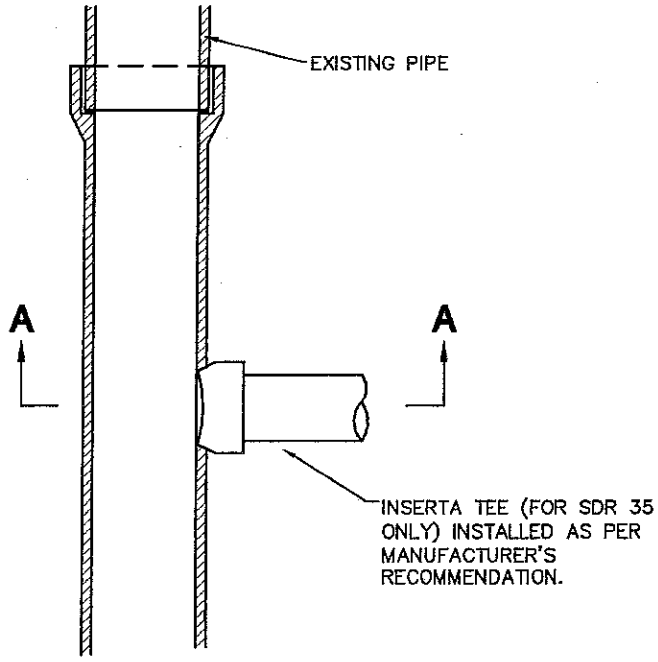
SERVICE LATERAL

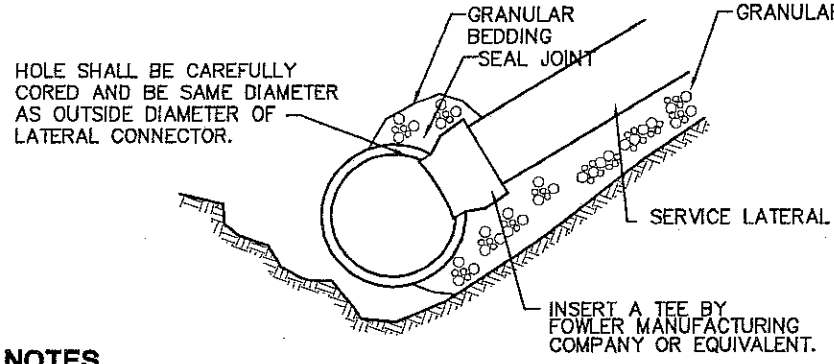


SECTION A-A

CONNECTION DETAIL

MERCER COUNTY CHOICE ONE ENGINEERING	# SANITARY SEWER CONNECTION DETAILS	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-8



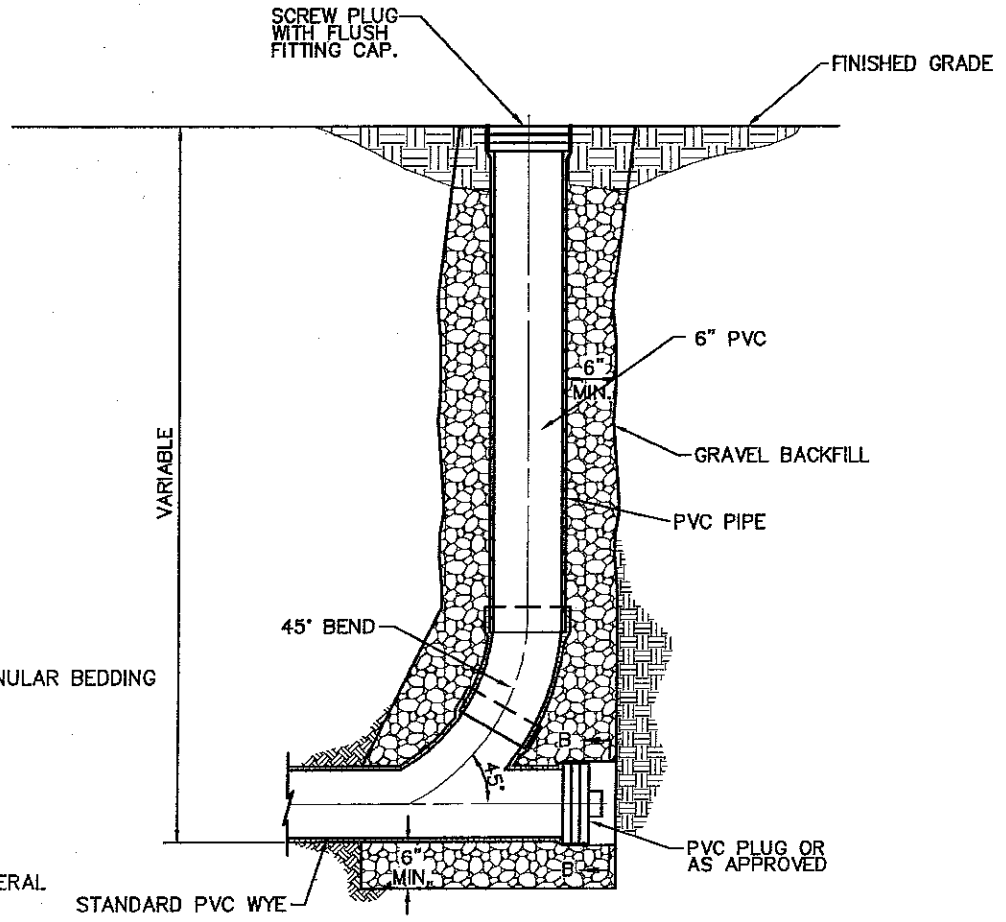


SECTION A-A

SADDLE NOTES

A. A GENACO SEAL TIGHT CAST IRON WITH RUBBER O-RING AND STAINLESS BANDING BOLTS (FOR VITRIFIED CLAY PIPE ONLY)

B. OTHER SADDLE TYPES THAT MAY BE AGREED TO ON CASE-BY-CASE BASIS DEPENDING ON SITUATIONS ARE ROMAC STYLE "CB" SEWER SADDLE AND DTW/ IPI FLEXIBLE SADDLE OR EQUIVALENT.



CLEANOUT DETAIL

NOTES

A. NO SERVICE LINE SHALL BE ALLOWED TO CONNECT DIRECTLY INTO A MANHOLE, SUBJECT TO APPROVAL BY THE COUNTY IN SPECIFIC CASES.

B. ALL ABANDONED SEWER LATERALS SHALL BE CAPPED AT THE OWNER'S EXPENSE.

MERCER COUNTY

CHOICE ONE ENGINEERING

SANITARY SEWER CLEANOUT AND SADDLE DETAILS

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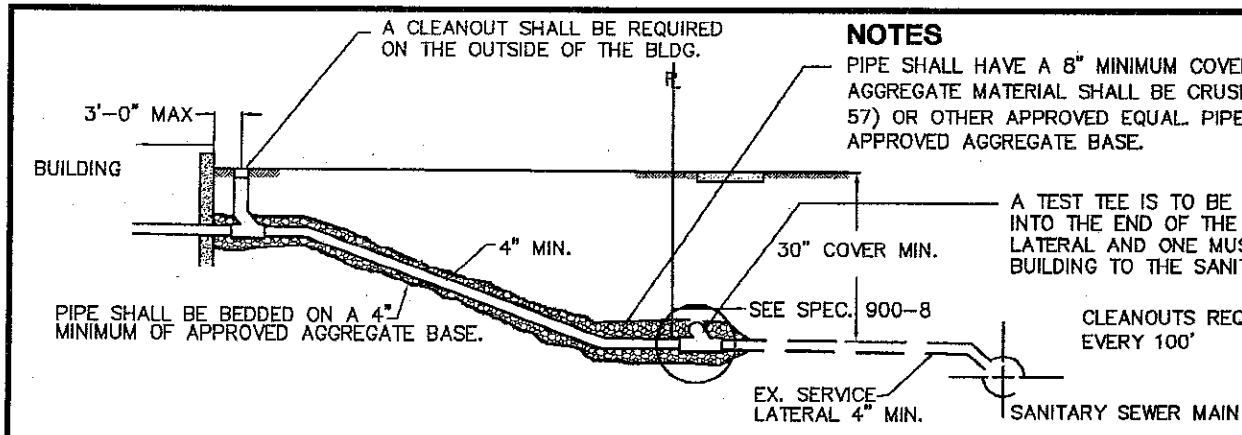

NOTES

PIPE SHALL HAVE A 8" MINIMUM COVER OF APPROVED AGGREGATE MATERIAL. APPROVED AGGREGATE MATERIAL SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (67 OR 57) OR OTHER APPROVED EQUAL. PIPES SHALL BE BEDDED ON A 4" MINIMUM OF APPROVED AGGREGATE BASE.

A TEST TEE IS TO BE INSTALLED AT THE CONNECTION. THE WYE SHALL BE INSTALLED INTO THE END OF THE EXISTING SERVICE LATERAL. IF THERE IS NO EXISTING SERVICE LATERAL AND ONE MUST BE INSTALLED, THEN THE TEST SHALL EXTEND FROM THE BUILDING TO THE SANITARY SEWER MAIN, UNLESS OTHERWISE APPROVED.

NOTES

A. SEPTIC TANKS, WHEN ABANDONED, SHALL BE DEWATERED AND PROPERLY FILLED WITH GRANULAR MATERIAL WITH ALL TILES BEING PLUGGED WITH CONCRETE.
B. ROOF DOWNSPOUTS, EXTERIOR FOUNDATION DRAINS, AREAWAY DRAINS OR OTHER SURFACE RUNOFF OR GROUNDWATER SHALL NOT BE CONNECTED TO THE SANITARY SEWER MAIN. ALSO SEE MISC. NOTE B.
C. ANY INDIVIDUAL OR FIRM INSTALLING SEWER CONNECTIONS SHALL BE APPROVED BY THE COUNTY.
D. BEFORE BEGINNING WORK, A SEWER TAP PERMIT MUST BE OBTAINED.
E. WHEN THE BUILDING CONNECTION MUST ENTER INTO A PAVED PORTION OF THE STREET OR ALLEY, A STREET OPENING PERMIT MUST BE OBTAINED BEFORE BEGINNING WORK.
F. WATER SERVICES SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN (WHENEVER POSSIBLE) OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN.

PIPE

A. THE PIPE MATERIAL SHALL BE PVC SDR 35 OR SCHEDULE 40, UTILIZING PURPLE PRIMER, OR AN APPROVED EQUIVALENT.
B. PIPE SIZES FOR BUILDING CONNECTIONS SHALL BE 4" MINIMUM FOR SINGLE RESIDENCE AND 6" MINIMUM FOR ALL OTHER USES. THE LATERALS SHALL BE RUN TO WITHIN 3' OF THE OUTSIDE OF THE BUILDING.

INSPECTION

A. A TAP INSPECTION SHALL BE REQUIRED ON ALL NEW BUILDING CONNECTIONS AND ALSO ON THE REPLACEMENT OF EXISTING BUILDING CONNECTIONS.
B. WHEN THE BUILDING SEWER IS READY FOR INSPECTION, THE COUNTY SHALL BE GIVEN 24 HOURS ADVANCE NOTICE. THE PIPE SHALL BE LEFT UNCOVERED UNTIL AN INSPECTION HAS BEEN MADE AND APPROVED.
C. ANY NEW BUILDING CONNECTION INSTALLED WITHOUT AN INSPECTION SHALL NOT BE APPROVED. IF THIS OCCURS, THE ENTIRE LATERAL SHALL BE UNCOVERED SO THAT A PROPER INSPECTION CAN BE MADE.
D. NO TAP FEE IS REQUIRED IF AN OLD BUILDING SEWER IS TO BE REUSED. AN INSPECTION WILL BE REQUIRED. THE COUNTY SHALL INSPECT THE ENTIRE BUILDING CONNECTION FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.
E. WHEN A SADDLE IS TO BE INSTALLED, THE INSPECTOR SHALL BE PRESENT WHILE THE SANITARY SEWER MAIN IS BEING CUT INTO. A SADDLE MAY BE USED WHERE A TEE OR WYE IS NOT PRESENT FOR LATERAL CONNECTION AND WHERE FLOW IS TO GREAT TO ALLOW THE MAIN TO BE CUT. ALWAYS COMPLETELY ENCASE CONNECTIONS AT ANY DEPTH 12' AND OVER AS APPROVED BY THE COUNTY.

TESTING

A. THE OUTSIDE PLUMBER SHALL BE RESPONSIBLE FOR THE TESTING FROM THE BUILDING TO THE TEST TEE AT THE PROPERTY LINE.
B. ALL NEW BUILDING CONNECTIONS SHALL BE BY AIR WITH 4 PSI PRESSURE.
C. WHEN A SUBSTANTIAL AMOUNT OF AN EXISTING LATERAL IS REPLACED, THE NEW PORTION OF THE LATERAL SHALL REQUIRE A TEST UNLESS OTHERWISE APPROVED.

MISC.

A. STREET EXCAVATION REQUIRES A STREET OPENING PERMIT.
B. BASEMENT FLOOR DRAINS AND SUMP PUMPS SHALL BE CONNECTED TO THE STORM SEWER.

PIPE LAYING

A. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE COUNTY BEFORE LEAVING THE WORK SITE FOR THE NIGHT.
B. THE JOINING OF PIPE WITH CONCRETE SHALL NOT BE ACCEPTED.
C. BEFORE MAKING A CONNECTION TO AN EXISTING SEWER OR SERVICE LATERAL, THE CONTRACTOR SHALL CHECK THE EXISTING PIPE BY UTILIZING A SEWER EEL, STRAP, OR SEWER ROD TO SEE THAT THE EXISTING PIPE IS OF SERVICEABLE CONDITION AND CONNECTED TO THE SANITARY SEWER MAIN.
D. IN THE CASE WHERE A 90° CORNER IS REQUIRED IN THE BUILDING CONNECTION LINE, 2 45° BENDS SHALL BE USED IN LIEU OF A 90° BEND. A CLEANOUT WILL BE REQUIRED.
E. THE BUILDING CONNECTION LINE SHALL BE LAID IN AS STRAIGHT A LINE, FROM THE BUILDING TO THE EXISTING LATERAL, AS POSSIBLE.
F. ALL NEW CONSTRUCTION SHALL HAVE SANITARY LATERALS INSTALLED.
G. DRAWINGS SHOWING LATERAL LOCATIONS SHALL BE SUBMITTED WITH A BUILDING PERMIT.

MERCER COUNTY CHOICE ONE ENGINEERING	# BUILDING SEWER DETAIL	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-10

LOW PRESSURE AIR TEST

A. AFTER BACKFILLING, THE AIR TEST SHALL BE CONDUCTED BETWEEN TWO CONSECUTIVE MANHOLES. ALL PIPE OUTLETS MUST BE PLUGGED IN THE SECTION BEING TESTED WITH SUITABLE TEST PLUGS. ONE OF THE PLUGS USED AT A MANHOLE MUST BE TAPPED AND EQUIPPED FOR AN AIR INLET CONNECTION FOR FILLING THE LINE FROM THE AIR COMPRESSOR. AIR SHALL BE SUPPLIED SLOWLY TO THE TEST SECTION UNTIL THE INTERNAL PRESSURE REACHES APPROXIMATELY 4 PSI. IF THE PIPE IS BELOW EXISTING GROUNDWATER LEVEL, THE INTERNAL PRESSURE SHALL BE INCREASED BY THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY BE OVER THE PIPE, BUT IN NO CASE SHOULD THE INTERNAL PRESSURE EVER EXCEED 5 PSI.

B. AT LEAST 2 MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE. WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE 3.5 PSI, THE AIR SUPPLY SHALL BE DISCONNECTED AND TIMING SHALL BEGIN WITH A STOP WATCH. THE STOP WATCH SHALL BE ALLOWED TO RUN UNTIL THE PRESSURE HAS DROPPED 1.0 PSI. IF THE TIME SHOWN ON THE STOP WATCH IS GREATER THAN THE SPECIFIED MINIMUM TIME, THE SECTION SHALL BE CONSIDERED TO HAVE PASSED THE TEST. TIME MAY BE INTERPOLATED FROM THE FIGURES LISTED BELOW.

PIPE DIA. (IN.)	100 FT.	150 FT.	200 FT.	250 FT.	300 FT.	350FT.	400FT.
4	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	2:50	2:50	2:50	2:50	2:50	2:51
8	3:47	3:47	3:47	3:47	3:48	4:26	5:04
10	4:43	4:43	4:43	4:57	5:56	6:55	7:54
12	5:40	5:40	5:42	7:08	8:33	9:48	11:24
15	7:05	7:05	8:54	11:08	13:21	15:35	17:48
18	8:30	9:37	12:49	16:01	19:41	22:26	25:38
21	9:55	13:05	17:27	21:49	26:11	30:32	34:54
24	11:24	17:57	22:48	28:30	34:11	39:53	45:35

SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)

DEFLECTION TEST

A. DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL–PIPE SYSTEM.

B. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF DEFLECTION EXCEEDS 5%, REPLACEMENT OR CORRECTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE REQUIREMENTS OF APPROVING AGENCY.

C. THE RIGID BALL OR MANDREL USED FOR THE DEFLECTION TEST SHALL HAVE A DIAMETER NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER OR AVERAGE INSIDE DIAMETER OF THE PIPE DEPENDING ON WHICH IS MANUFACTURED. THE PIPE SHALL BE MEASURED IN COMPLIANCE WITH ASTM D–2122 STANDARD TEST METHOD OF DETERMINING DIMENSIONS OF THERMOPLASTIC PIPE AND FITTINGS. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.

MANHOLE VACUUM TEST

ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED USING THE FOLLOWING PROCEDURES FROM ASTM C–1244.

A. PREPARATION OF THE MANHOLE

1. ALL LIFT HOLES SHALL BE PLUGGED.

2. ALL PIPES ENTERING THE MANHOLE SHALL BE TEMPORARILY PLUGGED TAKING CARE TO SECURELY BRACE THE PIPES AND PLUGS TO PREVENT THEM FROM BEING DRAWN INTO THE MANHOLE.

B. PROCEDURE

1. THE FIRST HEAD SHALL BE PLACED AT THE TOP OF THE MANHOLE IN THE CASTING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. A VACUUM OF 10" OF MERCURY (4.9 PSI) SHALL BE DRAWN ON THE MANHOLE, THE VALVE ON THE VACUUM LINE OF THE TEST HEAD CLOSED, AND THE VACUUM PUMP SHUT OFF. THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9" OF MERCURY (4.4 PSI).

3. THE MANHOLE SHALL PASS IF THE TIME FOR THE VACUUM READING TO DROP FROM 10" OF MERCURY (4.9 PSI) TO 9" OF MERCURY (4.4 PSI) MEETS OR EXCEEDS THE VALUES INDICATED ON THE TABLE.

4. IF THE MANHOLE FAILS THE INITIAL TEST, NECESSARY REPAIRS SHALL BE MADE BY AN APPROVED METHOD. THE MANHOLE SHALL THEN BE RETESTED UNTIL A SATISFACTORY TEST IS OBTAINED.

	DIAMETER, INCHES		
DEPTH (FT.)	48	60	72
	TIME, SECONDS		
8 OR LESS	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS

MERCER COUNTY

CHOICE ONE ENGINEERING

SANITARY SEWER TESTING NOTES

REVISIONS:

DATE APPROVED: JUNE 2000

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NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE COUNTY UNLESS 2 WORKING DAY'S NOTICE OF COMMENCING WORK IS GIVEN TO THE COUNTY.

B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE COUNTY.

C. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMPS, AND OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.

D. WHEN A SEWER IS TO BE EXTENDED AT THE DOWNSTREAM MANHOLE OR FIRST MANHOLE IN THE NEW LINE, IT SHALL BE PLUGGED BEFORE CONSTRUCTION BEGINS. IF THE SEWER IS SMALLER OR EQUAL TO 12" DIAMETER, IT SHALL BE PLUGGED BY PLACING A POLY-ETHELYNE BAG APPROXIMATELY 6" INTO THE SEWER PIPE AND POURING CONCRETE INTO AND AROUND THE SEWER PIPE AS DIRECTED BY THE COUNTY. SIZES LARGER THAN 12" WILL BE PLUGGED BY OTHER APPROVED METHODS. NO PLUGS SHALL BE REMOVED UNTIL CONSTRUCTION IS COMPLETED AND SOIL IS STABILIZED AND THEN ONLY AS DIRECTED BY THE COUNTY.

E. BEFORE EXISTING LATERALS ARE CONNECTED TO A NEWLY CONSTRUCTED MAIN SEWER, DYE TESTING, SMOKE, VIDEO TESTING, OR OTHER APPROVED MEANS OF INVERTING ACTION SHALL BE PERFORMED. THIS IS TO DETERMINE THAT ALL EXISTING SERVICES ARE CONNECTED, NO CLEAR WATER CONNECTIONS OCCUR, AND THAT EXISTING BUILDING SEWER ARE IN SERVICABLE CONDITION.

F. WHEN A CASTING OR OTHER PUBLIC PROPERTY IS ABANDONED IT REMAINS COUNTY PROPERTY.

G. NEW SEWERS MUST HAVE EPA PLAN APPROVAL.

H. THE ENDS OF ALL SERVICE LINES OR TEES SHALL BE ACCURATELY STAKED, LOCATED, MARKED, AND GIVEN TO THE CITY WITHIN 15 DAYS AFTER INSTALLATION.

EXCAVATION AND PIPE LAYING

A. THE LAYING OF THE PIPE SHALL COMMENCE AT THE LOWEST POINT, WITH THE BELL END LAID UPGRADE. THE PIPE SHALL BE CENTERED IN THE TRENCH AND ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE.

B. LASER SHALL BE USED UNLESS OTHERWISE APPROVED.

UTILITY STAKING

A. OFFSET AND GRADE AT EACH MANHOLE. OFFSET AND GRADE 50' AND 100' OUT FROM EACH MANHOLE UNLESS OTHERWISE APPROVED.

TESTING

A. BEFORE ANY SEWER LINE IS PLACED INTO SERVICE OR ACCEPTED BY THE COUNTY, IT SHALL BE SUBJECTED TO AND PASS LOW PRESSURE AIR TEST. EACH RUN BETWEEN MANHOLES, WITH ALL SERVICE LATERALS STUBBED INTO PROPERTY LINES, SHALL BE TESTED BEFORE BEING ACCEPTED. THE CONTRACTOR OR DEVELOPER SHALL FURNISH ALL EQUIPMENT AND MATERIAL NECESSARY TO CONDUCT THIS TEST. THE TRENCH SHALL BE COMPLETELY BACKFILLED BEFORE TESTING.

B. SEE SANITARY TESTING NOTES.

C. BEFORE FINAL ACCEPTANCE BY THE COUNTY AND BEFORE ANY SERVICE LINE IS PUT INTO USE, ALL SANITARY SEWERS AND MANHOLES SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER BY USE OF A SEWER-JET, OR EQUAL, TYPE OF EQUIPMENT.

PIPE

A. ALL PIPE AND SPECIALS SHALL BE PVC SDR-35 UNLESS OTHERWISE APPROVED BY THE COUNTY MINIMUM DIAMETER OF PIPE SHALL BE 8".

B. DUCTILE IRON PIPE WILL BE USED IN STREAM CROSSINGS AND WHERE MAXIMUM SEPARATION CAN NOT BE MAINTAINED.

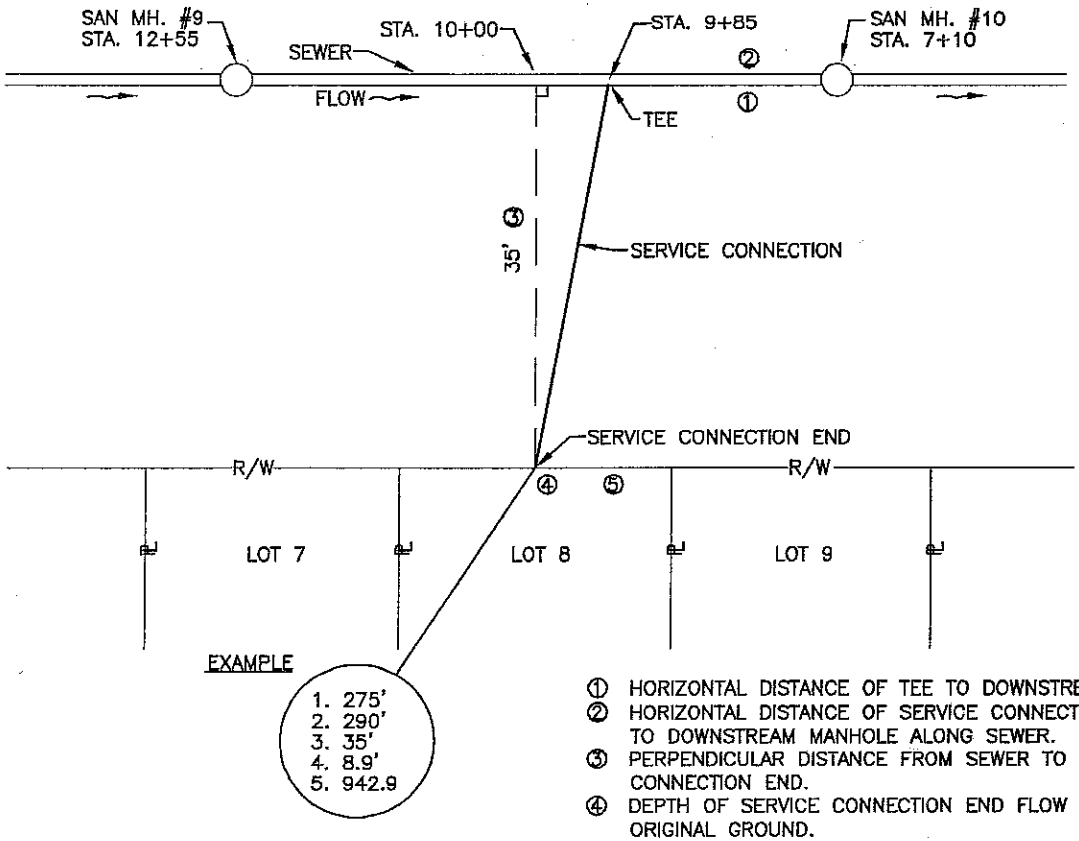
C. ALL JOINTS SHALL BE OF THE BELL AND SPIGOT TYPE, THE BELLS BEING FORMED INTEGRALLY WITH THE PIPE. THE BELL SHALL CONTAIN A FACTORY INSTALLED ELASTOMETRIC GASKET WHICH IS POSITIVELY RETAINED. NO SOLVENT CEMENT JOINTS WILL BE PERMITTED IN FIELD CONSTRUCTION EXCEPT AS SPECIFICALLY AUTHORIZED BY THE COUNTY.

FLEXIBLE PIPES	MATERIAL SPECIFICATIONS	JOINT SPECIFICATIONS
POLYVINYL CHLORIDE	ASTM D-3034 (SDR-35) PIPE STIFFNESS = 46PSI	ELASTOMERIC GASKET ASTM D-3212
DUCTILE IRON	ANSI A-21.51 & AWWA C-151	ANSI A-21.11 & AWWA C-111

1. SDR = OUTSIDE DIAMETER DIVIDED BY WALL THICKNESS.

2. THE SPECIFICATIONS ABOVE SHALL BE THOSE MOST RECENTLY ADOPTED BY THE APPROPRIATE STANDARDS SETTING ORGANIZATIONS.

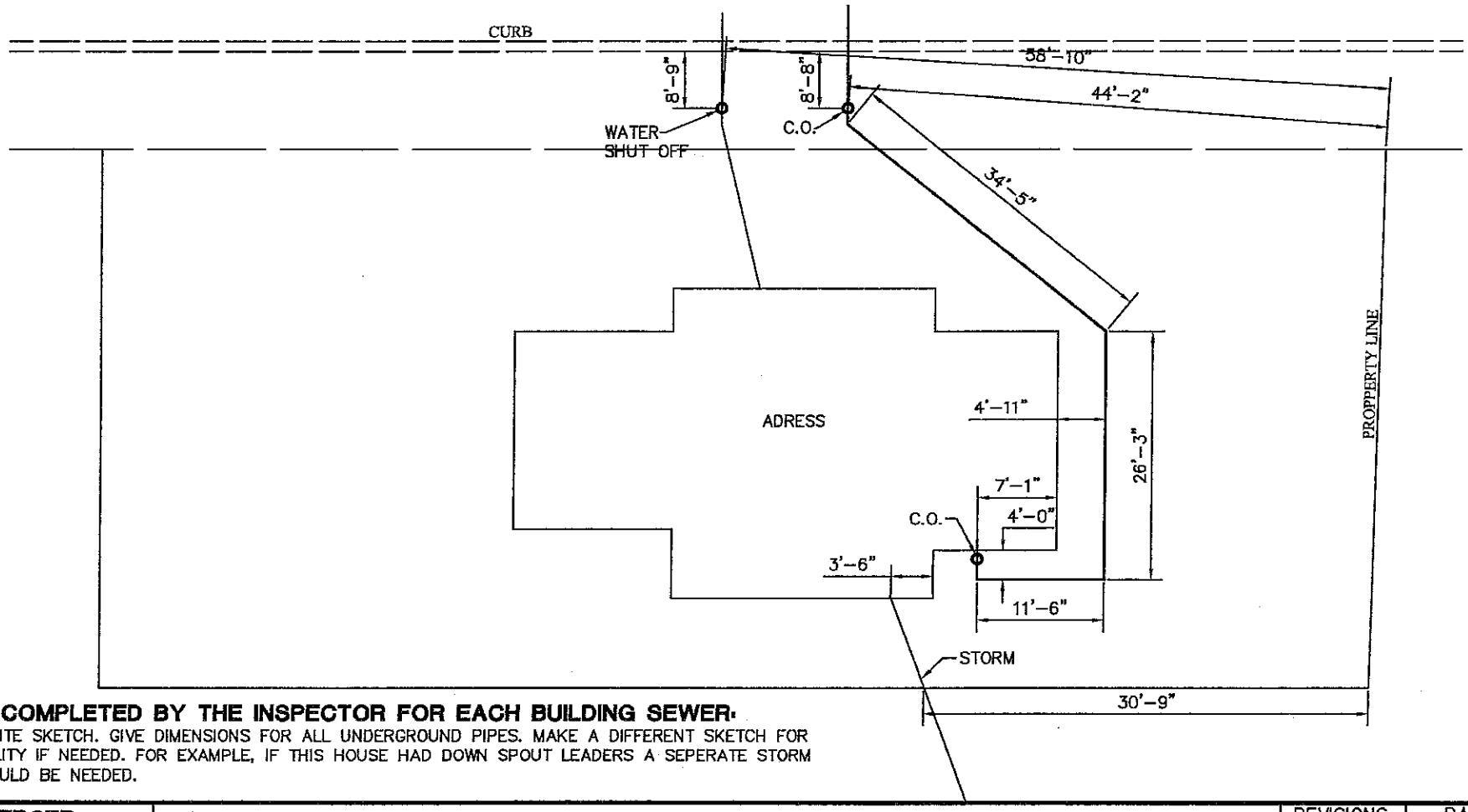
MERCER COUNTY CHOICE ONE ENGINEERING	MISCELLANEOUS SANITARY SEWER NOTES	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-12



NOTE: TO BE USED FOR RECORD DRAWINGS FROM DATA SUPPLIED BY CONTRACTOR

① HORIZONTAL DISTANCE OF TEE TO DOWNSTREAM MANHOLE.
② HORIZONTAL DISTANCE OF SERVICE CONNECTION END TO DOWNSTREAM MANHOLE ALONG SEWER.
③ PERPENDICULAR DISTANCE FROM SEWER TO SERVICE CONNECTION END.
④ DEPTH OF SERVICE CONNECTION END FLOW LINE TO ORIGINAL GROUND.
⑤ ELEVATION OF SERVICE CONNECTION END FLOW LINE.

MERCER COUNTY CHOICE ONE ENGINEERING	SERVICE CONNECTION LOCATION REFERENCE (VACANT LOTS) NO CONNECTION TO SERVICE	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 00–13



TO BE COMPLETED BY THE INSPECTOR FOR EACH BUILDING SEWER:
SAMPLE SITE SKETCH. GIVE DIMENSIONS FOR ALL UNDERGROUND PIPES. MAKE A DIFFERENT SKETCH FOR EACH UTILITY IF NEEDED. FOR EXAMPLE, IF THIS HOUSE HAD DOWN SPOUT LEADERS A SEPERATE STORM SHEET WOULD BE NEEDED.

MERCER COUNTY CHOICE ONE ENGINEERING	# SERVICE CONNECTION LOCATION REFERENCE (BUILDING IN PLACE)	REVISIONS:	DATE APPROVED: JUNE 2000 PAGE No. 900-14