engineers planners surveyors

bayer becker engineers

700 nilles road
fairfield, oh 45014
(513) 829-2149
fax (513) 829-2457

REC'D FEB 21 2001

February 20, 2001

Mr. Eric Pottenger
Butler Co. Engineers Office
1921 Fairgrove Avenue
Hamilton, OH 45011

Re: Chesterwood Retirement Community
Phase Three

Dear Eric,

Enclosed is a revised copy of the Construction drawings for the above referenced project.

Please consider these plans for approval.

If you should have any questions or comments, please call.

Sincerely,

Thomas D. Juengling

TDJ/gc
Enclosure

Cc: Don Dixon

O:\1995Jobs\95079\022001ep.doc

BCEO

BUTLER COUNTY
ENGINEER'S OFFICE

GREG WILKENS, P.E., P.S.
BUTLER COUNTY ENGINEER

February 28, 2001

Bayer-Becker Engineer's
Attn: Thomas D. Juengling
700 Nilles Road
Fairfield, Ohio 45014

RE: CHESTERWOOD RETIREMENT
COMMUNITY PHASE III
WEST CHESTER TOWNSHIP

Dear Tom:

This office has reviewed the construction drawings for the above referenced development and feels the following items should be considered for revision.

1. Submit storm sewer calculations for Phase III. Also, I haven't been able to find any detention calculations for the Phase III retention pond. Please send retention calculations too.
2. Provide a typical section of the proposed mounding on the grading plan. It appears a swale may need to be constructed between buildings No. 7 & 8 and along the rear of building No. 7 to the yard drain.
3. A swale looks to be needed in the rear of buildings No. 8 thru 11. Where and how is this runoff to drain?

When these items have been corrected, please submit the revised construction drawings.

Sincerely,

Eric J. Pottenger
Design Engineer

cc: File

DATE Nov. 1996
BY CAR
CK'D. _____

BAYER & BECKER ENGINEERS
CIVIL ENGINEERS • SURVEYORS • PLANNERS
LAWRENCEBURG, INDIANA

PROJECT 95-79
Chesterwood Phase Three
PAGE NUMBER 1.

SUBJECT Spillway and Catch Basin Out of Pond

Check Spillway Elev. = 886.00 With Pond Elev. = 884.00

(This could be higher, since water will have to travel over the lake.)

$Q_{10} = C I_{10} A$

where $T_c = 15.4$ min. $\Rightarrow I_{10} = \frac{176}{(15.4+23)} = 4.43$

$(A \times C) = 9.50$ Acres

$Q_{10} = (AC)\, I_{10} = (9.50) \times 4.43 = 42.01$ cfs

$Q_{100} = (AC)\, I_{100}$

$T_c = 15.4$ min. $\Rightarrow I_{100} = \frac{300}{T_c + 31} = \frac{300}{15.4+31} = 6.46$

$Q_{100} = (9.50) \times 6.46 = 61.37$ cfs

Try Spillway Elev. = 886.00
Building Elev. = 887.50

Try CB 2-3
T/GR = 885.50
WIN = 884.00
30" INV. = 882.38

30" @ 1.45%: $Q = \left(\frac{1.486}{0.015}\right)(4.909)(0.731)(0.0145)^{1/2} = 42.81$ cfs > 42.01 cfs OK

DATE Nov. 1996
BY CAR
CK'D. _____

BAYER & BECKER ENGINEERS
CIVIL ENGINEERS • SURVEYORS • PLANNERS
LAWRENCEBURG, INDIANA

PROJECT 95-79
Chesterwood Phase Three
PAGE NUMBER 2.

SUBJECT Spillway and Catch Basin out of Pond

From Spillway To Window of Catch Basin = 886.00 - 884.00 = 2'

From ODOT L&D. Vol. II, pgs. 11-3 and 11-4:

$Q = C L H^{3/2}$ For Window of Catch Basin,

where H = 886.00 - 884.00 = 2'
C = 3.0
L = 3.0' + 3.0' = 6.0'

$Q = (3.0)(6.0)(2)^{3/2} = 50.91$ cfs > 42.0 cfs.
∴ CB 2-3 will be OK

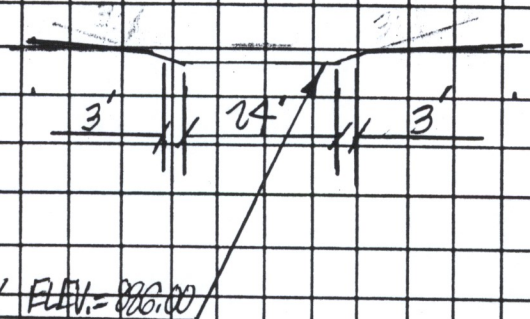
Design Spillway For Q_{100} = 61.37 cfs

Building Elev. = 887.50
Spillway Elev. = 886.00

$Q = 3.33 L H^{3/2}$

$H = \left(\frac{Q}{(3.33)(L)}\right)^{2/3} = \left(\frac{61.37}{(3.33)(27)}\right)^{2/3}$

$H = 0.78' < 1'$



Use 30' Drainage Route For 100 Year Storm.

V = Q/A = 61.37 cfs ÷ (27' x 0.78') = 2.9 fps

∴ Use Seed.

DATE Nov. 1996
BY CAR
CK'D. _____

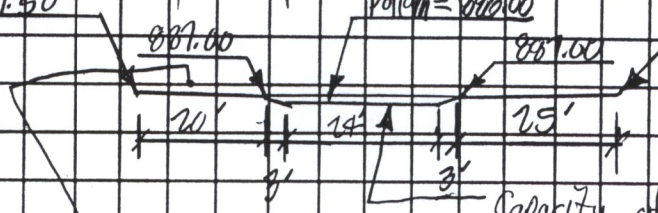
BAYER & BECKER ENGINEERS
CIVIL ENGINEERS • SURVEYORS • PLANNERS
LAWRENCEBURG, INDIANA

PROJECT 95-79
Chesterwood Phase Three
PAGE NUMBER 3.

SUBJECT Spillway

Check Capacity of Entire Spillway For $Q_{100} = 61.37$ cfs

Building = 887.50 | Patio = 886.00 | Building = 887.50



Capacity of This 30' Wide Section $= (3.33)(27')(1)^{3/2} = 89.91$ cfs

Capacity of Section Between Elev. 887.00 and Elev. 887.50:

Capacity of Middle Section
$= (3.33)(30)(0.50)^{3/2} = 35.32$ cfs

Capacity of Outside Sections
$= (3.33)\left(\left(\frac{1}{2}\right)(20') + \left(\frac{1}{2}\right)(25')\right)(0.50)^{3/2}$
$= 26.49$ cfs

Total Spillway Capacity $= 151.72$ cfs → 61.37 cfs

DATE October 1996
BY CAR
CK'D. _____

BAYER & BECKER ENGINEERS
CIVIL ENGINEERS • SURVEYORS • PLANNERS
LAWRENCEBURG, INDIANA

PROJECT 95-79
Chesterwood Retirement
PAGE NUMBER _____

SUBJECT Check Water Balance of Proposed Pond

Check water balance in proposed pond, assuming clay bottom is impervious.

Reference: Hydrology and Quality of Water Resources, Hammer & MacKichan, page 126 (Fig. 6-1), page 371, and page 372 (Fig. 8-14)

Surface Inflow + Seepage Inflow = Outflow + Seepage Loss + Evaporation + Change In Storage

Assume zero if bottom is impervious.

Assume zero if bottom is impervious.

From Fig. 6-1, avg. annual precipitation = 1046 mm = 41.18 inches
From Fig. 8-14, avg. annual evaporization = 867 mm = 34.13 inches

$$\text{Evaporization} = (34.13 \text{ inches})\left(\frac{1 \text{ ft}}{12 \text{ inches}}\right)(30480 \text{ S.F.}) = 86690 \text{ Cu. Ft. Per Year}$$

Calculate Drainage Area Required To Go Into Lakes To Keep Them Filled:

$$\text{Surface Inflow} = (41.18 \text{ inches})\left(\frac{1 \text{ ft}}{12 \text{ inches}}\right)(X \text{ Acres})(78\%)(43560 \text{ S.F./Acre})$$

(Runoff Coefficient)

$$\text{Surface Inflow} \geq 86690 \geq (10624)(X)$$

$$8.16 \text{ Ac.} = X$$

8.16 Acres Are Required To Drain Into Lake To Keep It Filled, Assuming It Is Filled At The Start.

Site Area ≈ 9 Acres.

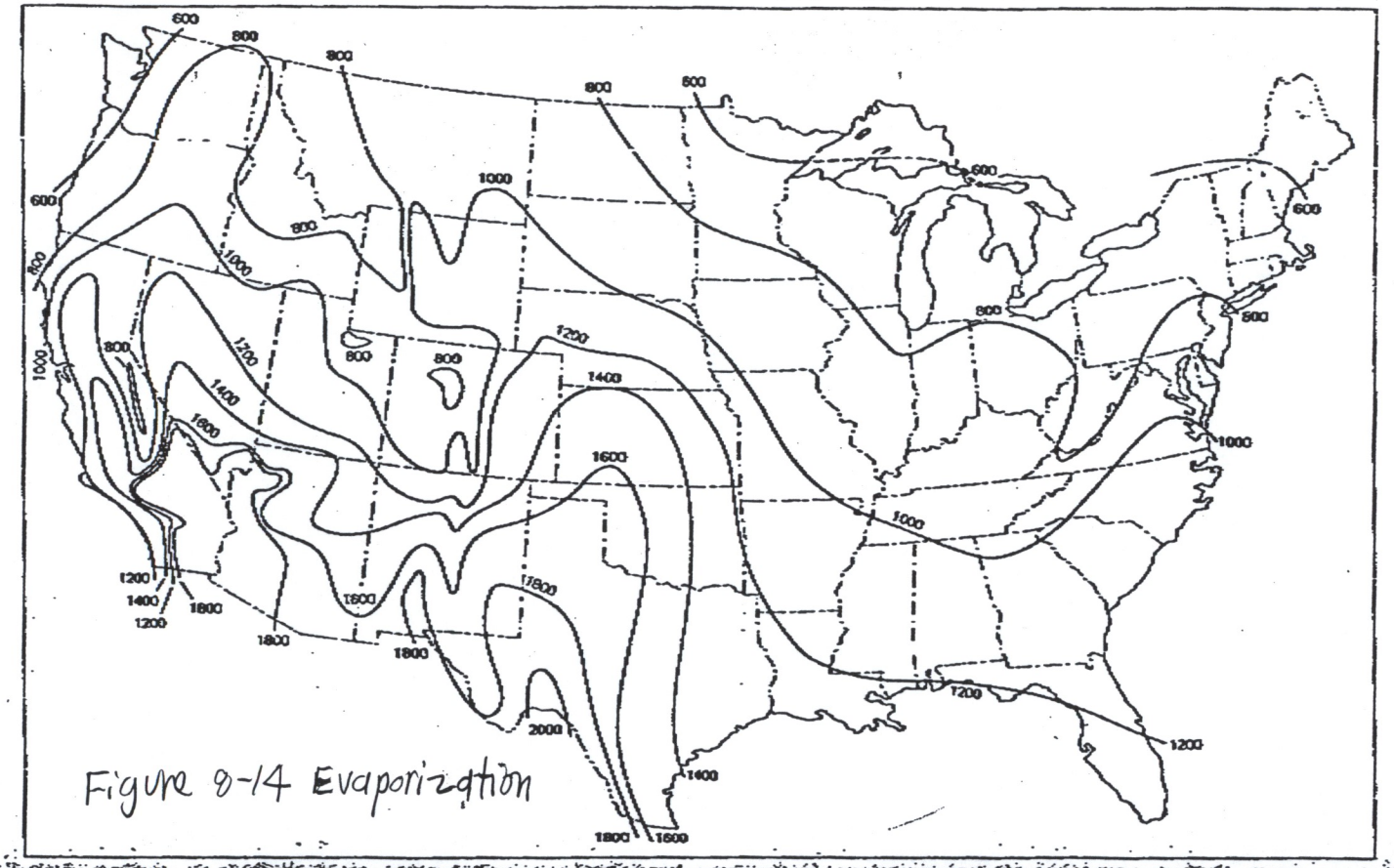
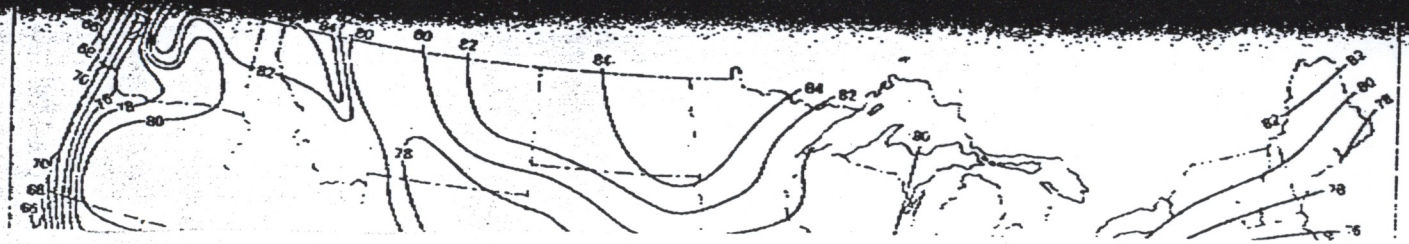


Figure 8-14 Evaporization



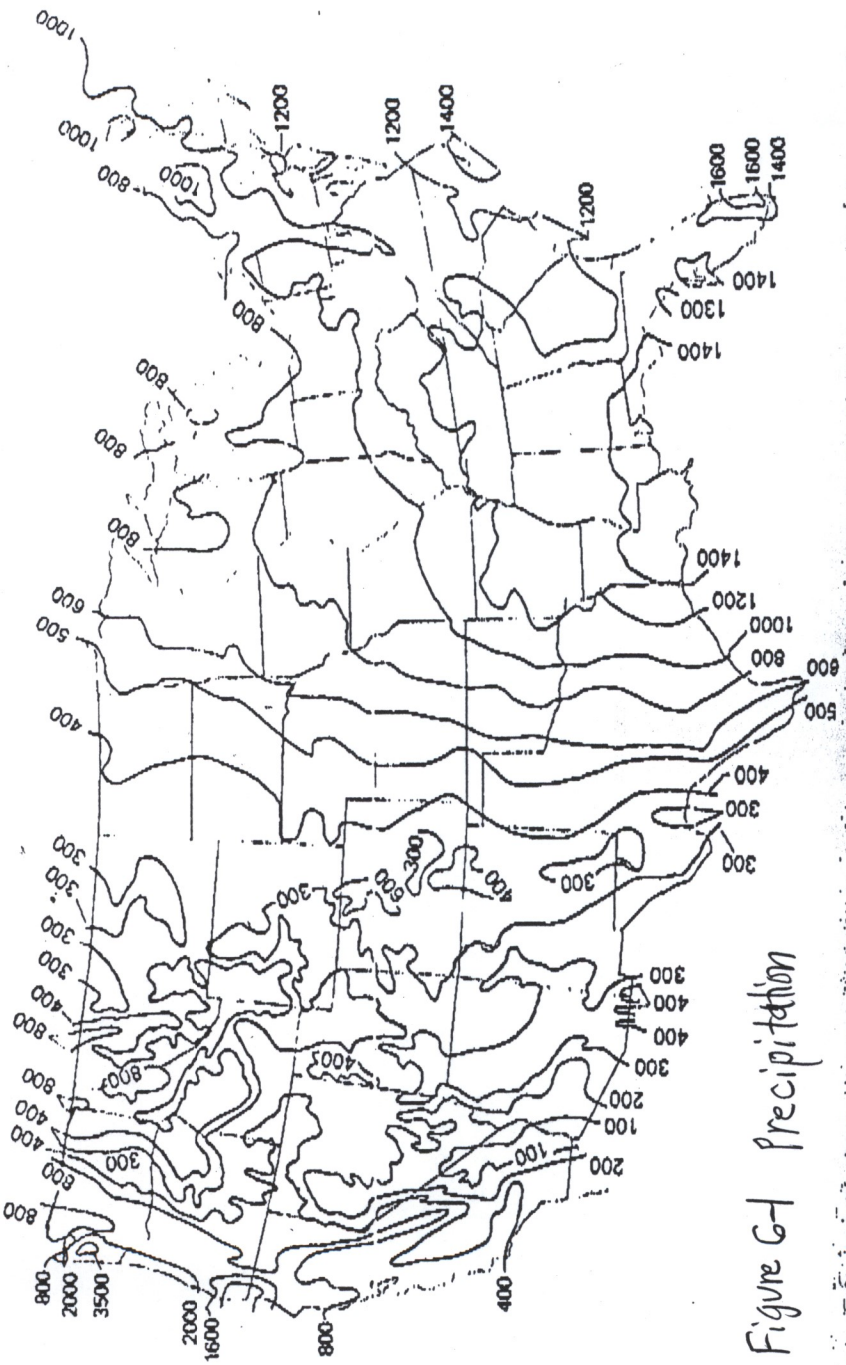


Figure 6-1 Average annual precipitation in millimetres in the contiguous United States. Note the orographic effect along the western

Figure 6-1 Precipitation

...ction from floods is a major conc
...sections that describe the probal
...the timing and shape of a flood
...ntrol of floods.
...eam carves a channel to fit its flow
...concerned with some of the afteref

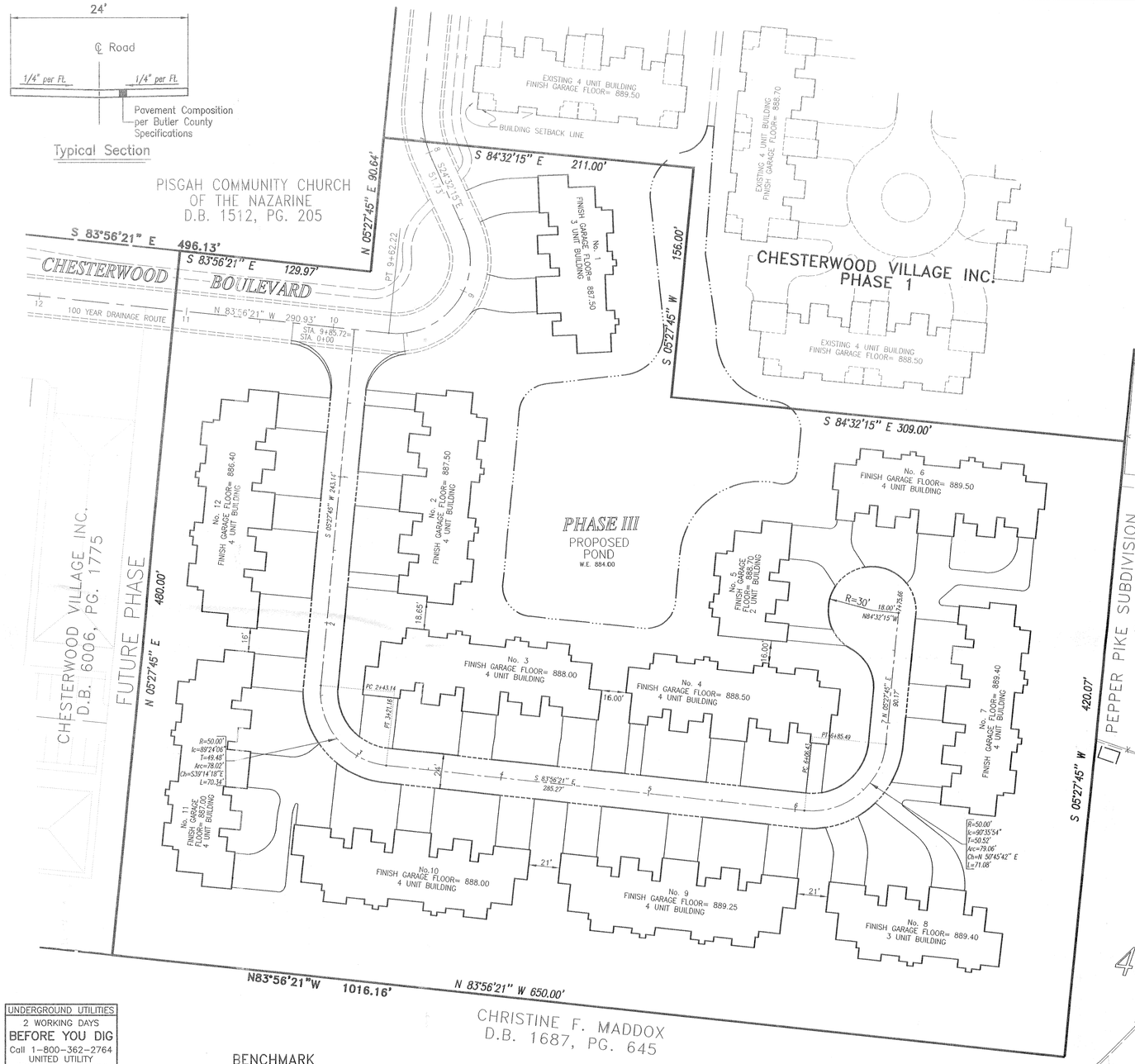
Precipitation

...itation is the discharge of water out
...nd sleet. It is the source of all water
...ground. The quantity and variabilit
..., intensity, and distribution of pre
...recipitation records can be used to e
...pitation occurs when air containing
...er vapor to condense on hydroscopi
... for water. The droplets coalesce
...nal resistance of falling. The only kr
...e available precipitation is pressure
...to high levels. The rate and quanti
... of cooling and the moisture conten
...g of the air can be caused by topogr
...raction and convergence of air curre
...orographic precipitation, which is g
... the leeward side. For example, pre
...orographic as illustrated in Figure 6-
...ntensity. Convective precipitation is
...e earth. The warmed air, and therefo
...recipitation ranges from moderate to
...either by warm air lifting over a w
...e. The latter is a large rotating mass
...with a low-pressure area at the center
...light to moderate.

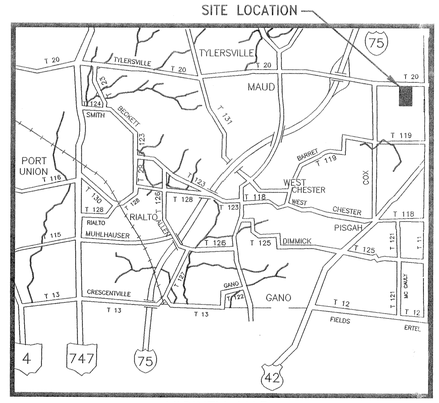
...ing Precipitation

...itation is measured in both nonrecord
...pect to time. Snow measurements ar
...ent. The U. S. Weather Service sta
...ed in Figure 6-2, consists of a 203-m
...receiver, an overflow chamber, and a
...llector and funneled into the receive
...l area one-tenth that of the collector.
...ured with a stick graduated in millime

Typical Section



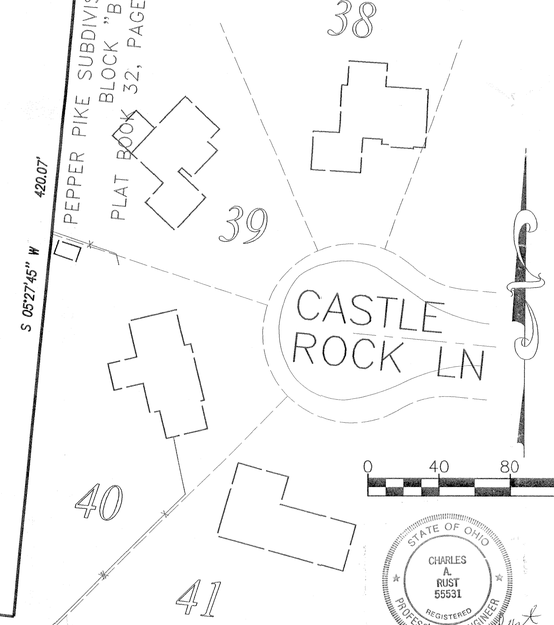
SITE LOCATION



VICINITY MAP
SCALE=N.T.S.

POOL

*10' horizontal separation from outside edges of water line and sanitary/storm sewer required. If the water main crosses either over or under the sanitary/storm sewer pipe, 18" vertical distance between the outside edges of the water and sewer lines shall be provided. Where water line crosses under the sewer, structural support shall be provided for the sewer pipe to prevent damage to the water main and to maintain line and grade of the sewer pipe. Where 18" of seperation is not possible, the sewer shall be either encased or constructed to water main standards for a minimum of 10" on each side of the water main.



GENERAL NOTES

1. Item numbers refer to the Ohio Department of Transportation construction and material specifications, and all construction work shall be done according to said specifications of Butler County requirements and standards for subdivisions. When in conflict, the County requirements shall prevail.
2. Items that pertain to underground utilities such as watermain pipe, sanitary sewer pipe, water valves and manhole frames and covers, etc., will remain under specifications of the utility serving the area. Storm sewers shall be designed and constructed in accordance with the requirements of the Butler County Engineer.
3. All trenches within the right-of-way and 10' utility easement shall be compacted and backfilled in accordance with item 203 and 603 in the state specifications.
4. A minimum 10' utility easement shall be shown on the record plat parallel and immediately adjacent to the right-of-way line allowing for installation, operation and maintenance of sewers, water, electric and telephone conduits and any other public or quasi public utility.
5. Developer shall be responsible for the installation of conduits for the full width of the public right-of-way at a depth of 36" for use by the electric, telephone and cable TV services. The location of the lines shall be coordinated with utility companies by the developer.
6. All electrical transformers shall be located so that they do not interfere with the existing manholes or water main appurtenances.
7. Water main materials, valves, fire hydrant, fittings and appurtenances and installation to be as per Butler County specifications using class 53 Ductile Iron as per AWWA C-151 with 4' minimum cover.
8. Sanitary sewer materials and installation to be as per Butler County specifications, using ABS 6" pipe, as per ASTM D-2751 with joint specification as per ASTM D-3212, using ABS composite 8" pipe, as per ASTM D-2680 with joint specification as per ASTM D-2235.
9. Minimum 10" horizontal, 18" vertical separation between Water Main and Sanitary and/or Storm Sewer.(see note * at left)
10. Storm sewer pipe to be A.D.S. N-12 plastic or equal unless otherwise noted on plans. Bedding to be first class. All sewers to be installed as per Butler County specifications.
11. Roof drains, foundation drains, and other clean water connections to the sanitary sewer system are prohibited.
12. All catch basins with a depth greater than 4.5' shall be provided with steps. Steps shall meet the requirements of ODOT STD. 604 and shall conform to the details as shown on Butler County Standard Drawing MH-1A.
13. All buildings to be served by the public sewer system shall be constructed so as to provide a minimum of four feet (4') of vertical separation between the public sanitary sewer, at the point of connection, and the lowest building level served by a gravity sewer connection. In addition, said building level shall be at least one foot (1') above the lowest point of free-overflow (non-sealed manhole cover) upstream of any treatment facility or wastewater pumping facility that receives the discharge from said building. Said minimum service levels shall be recorded on the "As Built" plans for the development which will be kept on file in the office of the Butler County Sanitary Engineer.
14. Butler County Water and Sewer Department does not accept any responsibility for the relocation, repair, or replacement of any other utility installed within five (5) feet of the center line of any sanitary sewer main or water main.
15. All water main valves to have a minimum depth of 2.5' from proposed grade to the top of the Valve Operating Nut.

PHASE 3
PROJECT SUMMARY

Number of Units	44
Parking	
Required:	44
Provided:	56
Ratio:	1:1.27
Acreage:	
Gross (Incl. R/W)	7.17 ACRES
Right-of-Way	0 ACRES
Net	7.17 ACRES
Open Space	20%
Zoning:	R-PUD

FEB 16 2001

STATE OF OHIO
CHARLES A. RUST 55531
REGISTERED
PROFESSIONAL ENGINEER

December 1997

UNDERGROUND UTILITIES
2 WORKING DAYS
BEFORE YOU DIG
Call 1-800-362-2764
UNITED UTILITY PROTECTION SERVICE
NON MEMBERS MUST BE CALLED DIRECTLY

BENCHMARK

TOP OF CONC. MONUMENT #833 AT S.E. CORNER OF McGINNIS PARK, COX RD. ELEV. = 882.78

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS
CB - 3A CATCH BASIN
CB - 3A (MOD.) CATCH BASIN
CB - 1 CATCH BASIN
CB 2-2-A CATCH BASIN
STD. MANHOLE 1A
HEADWALL HW-4

CONSTRUCTION APPROVAL	DATE
Zoning Commision	11/18/96

These plans are not for construction until ALL approval dates have been filled in.

OWNER/DEVELOPER

Chesterwood Village, Inc.
4195 Hamilton Mason Road
Indian Springs, Ohio 45011

NOTES:

1. A 20' Sanitary Sewer Easement, 15' Water Line Easement, and Ingress-Egress Easement to be provided on Easement Plat.
2. Pedestrian walkway is to be 6' wide and composed of item 304 - 6" aggregate base, item 402 - 1 1/2" asphalt concrete, and item 404 - 1 1/2" asphalt concrete.

FINAL PUD PLAN

INDEX TO SHEETS

General Notes & Layout Plan	1
Utility Plan	2
Grading Plan	3
Profiles	4
Soil Erosion & Sedimentation Details	5
Standard Detail Sheets	6

CHESTERWOOD RETIREMENT COMMUNITY
PHASE THREE
SECTION 11, TOWN 3, RANGE 2
UNION TOWNSHIP
BUTLER COUNTY, OHIO

LAYOUT PLAN

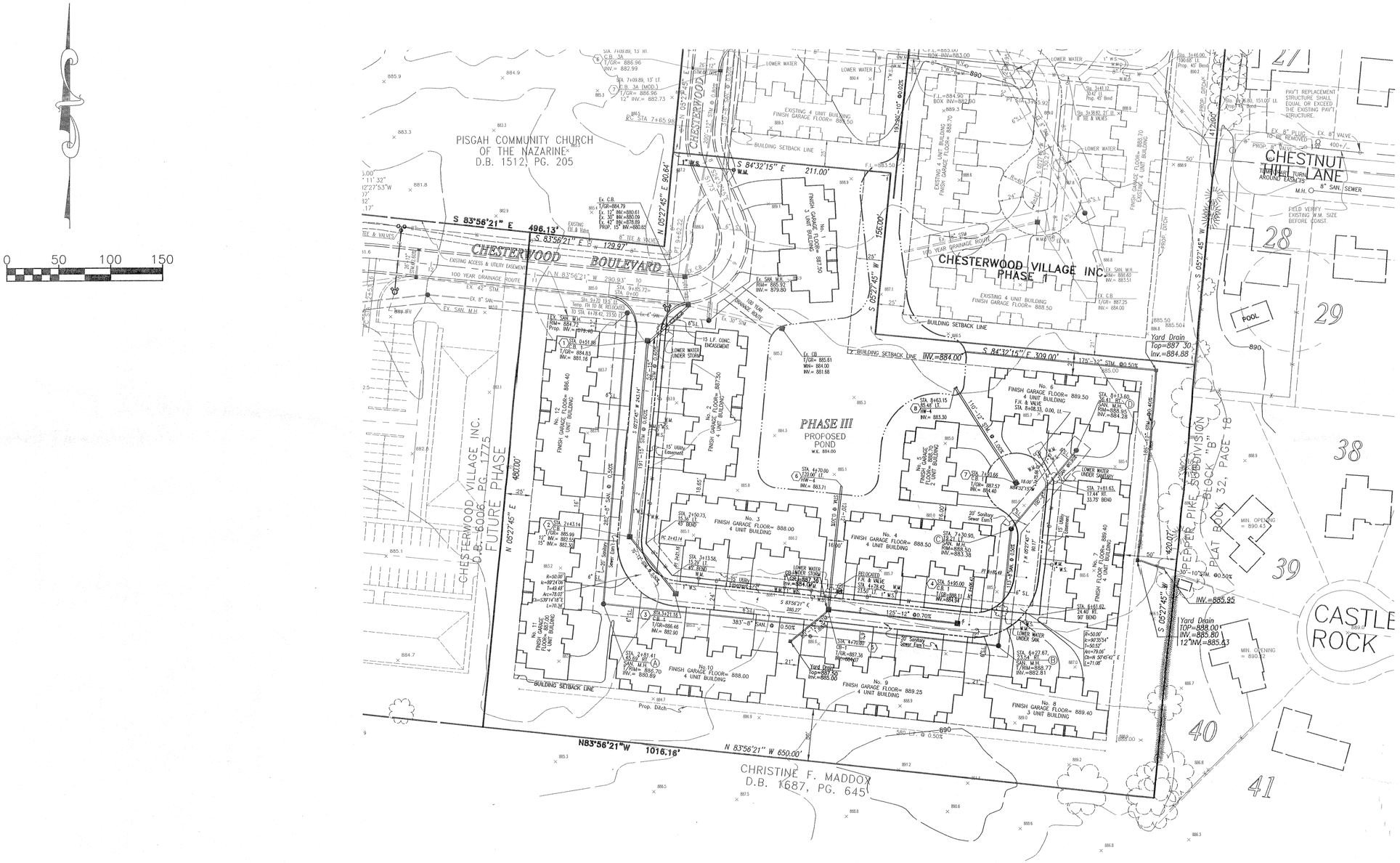
DATE:	REVISION/COMMENT
3/4/97	Revised per Owners Request
11/4/96	Complete for Union Township Submittal

DESIGNED: CLM/MAR DRAWING: 9579-1.DWG
DRAWN: TAB DATE: 10/31/96
CHECKED: CAR SCALE: 1"=40'
JOB NUMBER: 9579 SHEET NO: 1 OF 6

engineers planners surveyors
bayer becker engineers
1230 belleview dr., lawrenceburg indiana 47025-1912
812-537-9064

Plans @ 2-28-01

J:\95\9579\TITLE3 Wed Dec 10 10:20:56 1997 Mike Pleva - Bayer Becker Engineers



NOTE:
(1) 18" MIN. VERTICAL CLEARANCE OD TO OD TO BE MAINTAINED BETWEEN WATER MAIN AND STORM AND SANITARY SEWERS AT CROSSOVERS.
(2) LOWER WATER SERVICES AS NEEDED TO AVOID CONFLICTS WITH STORM WITH MIN. 4' COVER.
(3) LOCATION OF ALL EXISTING UTILITIES TO BE DETERMINED IN THE FIELD PRIOR TO WORK BEGINNING.
(4) 48 HOUR NOTICE TO BE PROVIDED TO PROPERTY OWNERS AFFECTED BY SHUTDOWN OF WATER MAIN.

STATE OF OHIO
CHARLES A. RUST
55531
REGISTERED
PROFESSIONAL ENGINEER
Charles A. Rust
December 1997

engineers planners surveyors
bayer becker engineers
1230 KELLEMEYER DR. LAWRENCEBURG IN. 47025-1912
812-537-0064

CHESTERWOOD RETIREMENT COMMUNITY
PHASE THREE

UTILITY PLAN

ITEM	REVISIONS	DATE
1	Complete for Union Township Submittal	11/4/96
2	Revised per Owners Request	3/4/97
3		
4		
5		
6		
7		

AutoCAD Drawing Name: M9579.DWG
DATE: 10-30-98

j:\95\9579\m9579 Wed Dec 10 12:47:20 1997 Mike Pleva - Bayer Becker Engineers

SEDIMENTATION CONTROL NOTES

The project has been designed to control erosion and prevent damange to other property. All stripping, earthwork, and regrading shall be performed to mininize erosion. Natural vegetation shall be retained wherever possible. The proposed plan will allow almost all eroded materials to be retained on site.

All areas disturbed by the construction of the roadways, ditches and sedimentation basins shall be seeded. Payment will be by the number of square yards disturbed as per the grading plan.

METHOD

Straw bales are to be utilized to create temporary dams to catch the silt. These are to be installed at points where the flow is concentrated.

Surface water is to be directed into these temporary silt basins by means of temporary swales and ditches.

As the installation of the storm sewer progress, staw bales are to be placed at the inlet and outlet of sewers to control the silt.

Payment for the above shall be included in items Excavation, Embankment.

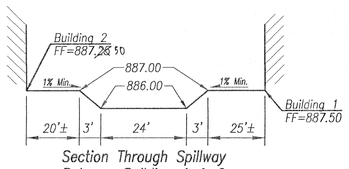
"All sediment and erosion control measures must be visually inspected and the appropriate maintenance and repair actions taken whenever precipitation exceeds 1/2 inch in any 24 hour period."

EROSION CONTROL LEGEND

1. SEEDING AND MULCHING
2. SODDING
3. PRESERVING EXISTING VEGETATION
4. STRAW BALE
5. SILT FENCE
6. SOIL PILES
7. TEMPORARY STREAM CROSSING
8. GRAVEL CURB INLET SEDIMENT FILTER
9. BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
10. CABIONS
11. STRAW BALE DROP INLET SEDIMENT FILTER
12. SOD DROP INLET SEDIMENT FILTER
13. GRAVEL & WIRE MESH DROP INLET SEDIMENT FILTER
14. BLOCK & GRAVEL CURB INLET SEDIMENT FILTER
15. SEDIMENT BASINS & DAMS
16. DIKES & SLOPE PROTECTION
17. ROLLED GRAVEL CURB INLET SED. FILTER (SEE SOIL EROSION & SEDIMENTATION CONTROL DETAIL SHEET) SHEET 6

DENOTES PROPOSED SWALE

NOTE: *A SILT FENCE SHALL BE PLACED DOWNHILL ALONG THE PERIMETER OF ALL GROUND TO BE DISTURBED BEFORE ANY GRADING BEGINS*



Section Through Spillway Between Building 1 & 2

STATE OF INDIANA
CHARLES A. RUST
55531
REGISTERED
PROFESSIONAL ENGINEER

Charles A. Rust
September, 1997

bayer becker engineers
engineers planners surveyors
1230 BELLEMEY DR. LAWRENCEBURG IN. 47025-1912
812-537-9064

CHESTERWOOD RETIREMENT COMMUNITY
PHASE THREE

GRADING AND EROSION CONTROL PLAN

ITEM	DATE	REVISIONS
1	11/4/96	Complete for Union Township Submittal
2	3/4/97	Revised per Owners Request
3		
4		
5		
6		
7		

AutoCAD Drawing Name: MB579.DWG
DATE: 10-30-96

3 OF 6

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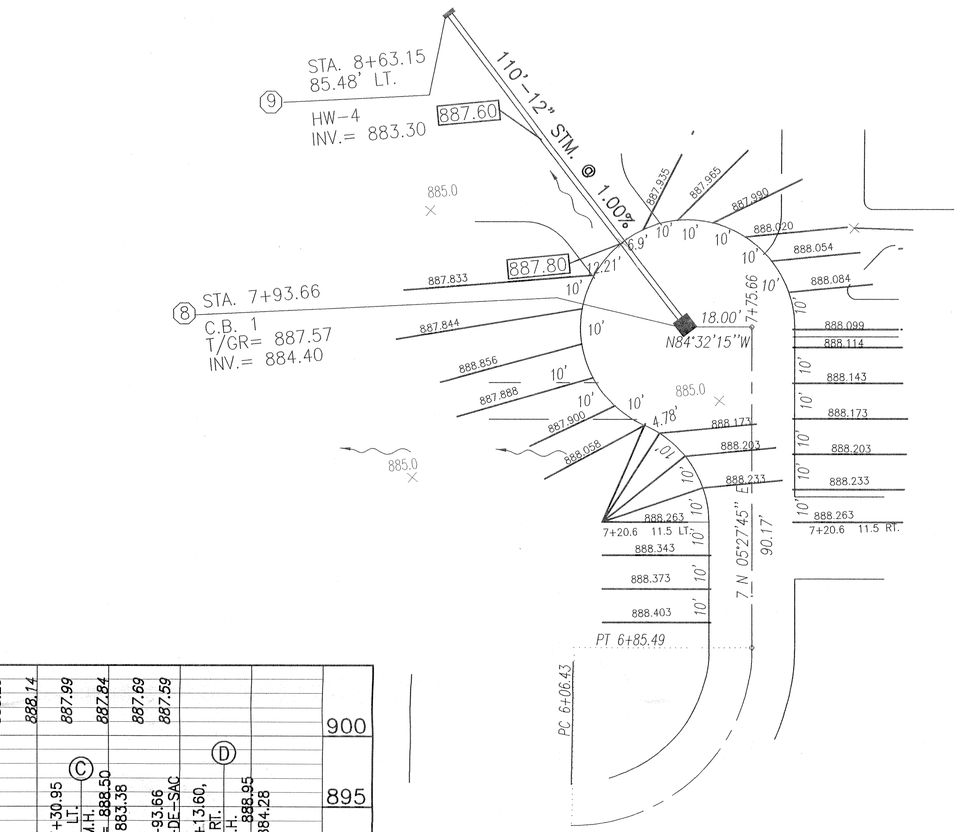
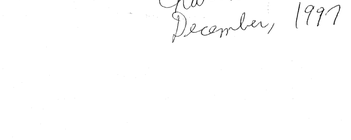
Road Profile



Cul-de-sac Detail



bayer becker engineers
surveyors planners engineers
1220 BELLEVUE DR. LAWRENCEBURG IN. 47025-1912
812-537-0064

CHESTERWOOD RETIREMENT COMMUNITY
PHASE THREE

PROFILE & DETAILS

ITEM	REVISIONS	DATE
1	Complete for Union Township Submittal	11/4/96
2	Revised per Owners Request	3/4/97
3	Revised Cul-de-sac Detail	9/8/97
4		
5		
6		
7		

AutoCAD Drawing Name: M9579.DWG

DATE: 10-30-96

J:\M9579\M9579 Wed Dec 10 12:38:40 1997 Mike Pleva - Bayer Becker Engineers

GENERAL NOTES

EROSION AND SEDIMENT CONTROLS

Vegetative practices
Such practices may include: temporary seeding, permanent seeding, mulching, matting, sod stabilization, vegetative buffer strips, phasing and protection of trees. The contractor shall initiateappropriate vegetative practices on all disturbed areas withinseven (7) dys if they are to remain dormant (undisturbed) for more than forty-five (45) days. Permanent or temporary soil stabilization shall be applied to disturbed areas within seven (7) days after final grade is reached on any portion of the site.

Structural Practices
Structural practices shall be used to control erosion and trap sediment from all sites remaining disturbed for more tha fourteen (14) days.

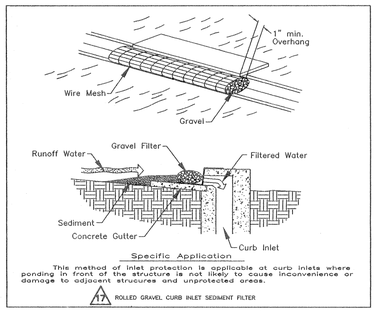
Timing
Sediment control structures shall be functional throughout earth disturbing activity. Sediment ponds and perimeter sediment barriers shall be implemented as the first step of grading and within seven days from the start of grubbing. They shall continue to function until the upslope development area is restabilized.

Sediment Barriers
Sheet flow runoff from denuded areas shall be intercepted by sediment barriers. Sediment barriers, such as sediment fences or diversions direction runoff to settling facilities, shall protect adjacent properties and water resources from sediment transported by sheet flow.

Erosion and sediment control practices used to satisify the conditions of this plan shall meet the standards and specifications in the current edition of Water Management and Sediment Control in Urbanized Areas (Soil Conservation Service.)

Waste Disposal
No solid or liquid waste, including building materials, shall be discharged in storm water runoff. Off-site vehicle tracking of sediments shall be minimized. The plan shall ensure and demonstrate compliance and applicable State of local waste disposal, sanitary sewer or septic system regulations.

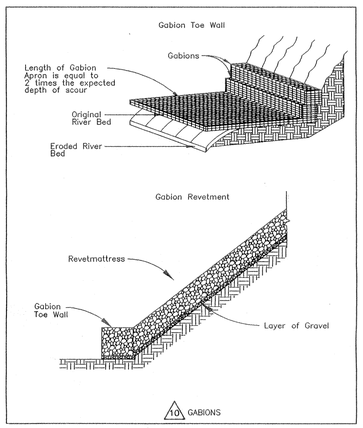
Maintenance
All temporary and permanent control practices shall be maintained and repaired as needed to assure continued performance of their intended function.



Specific Application

This method of inlet protection is applicable at curb inlets where ponding in front of the structure is not likely to cause inconvenience or damage to adjacent strucures and unprotected areas.

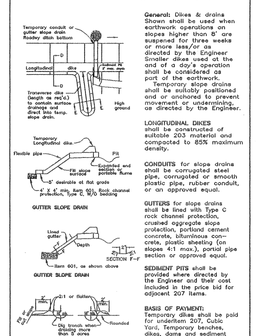
17 ROLLED GRAVEL CURB INLET SEDIMENT FILTER



10 GABIONS

Source: Adapted from product literature of Bekaert Gabions.

DIKES AND SLOPE PROTECTION



GUTTER SLOPE DRAIN

GUTTER SLOPE DRAIN

SECTION D-D SECTION E-E

General: Dikes & drains Shown shall be used when earthwork operations on slopes higher than 5' are suspened for three weeks or more less/or as directed by the Engineer and at the end of a day's operation shall be considered as part of the earthwork. Temporary slope drains shall be suitably positioned and anchored to prevent movement or undermining, as directed by the Engineer.

LONGITUDINAL DIKES shall be constructed of suitable 203 material and compacted to 85% maximum density.

CONDUITS for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

GUTTERS for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe section or approved equal.

SEDIMENT PITS shall be provided where directed by the Engineer and their cost included in the price bid for adjacent 207 items.

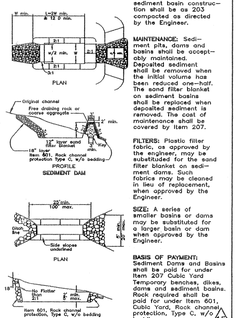
BASIS OF PAYMENT:
Temporary dikes shall be paid for underitem 207, Cubic Yard, Temporary benches, dikes, dams and sediment basins. Temporary slope drains shall be paid for under Item 207, Linear foot, Temporary slope drains. Rock required shall be paid for under Item 601, rock channel protection, Type C, w/o bedding.

TEMPORARY SLOPE DRAINS RECOMMENDED SIZES				
Areas in Acres	Pipe Sizes Smooth Corrugated	Round	Rectangular	Gutter depth
0-4	6"	12"	18"	8"
4-8	8"	12"	18"	8"
8-12	10"	15"	21"	12"

Not to scale

16

SEDIMENT BASINS & DAMS



EMBANKMENT for sediment basin construction shall be as 203 compacted as directed by the Engineer.

MAINTENANCE: Sediment pits, dams and basins shall be accepatably maintained. Deposited sediment shall be removed when the initial volume has been reduced one-half. All trash and debris on sediment basins shall be replaced when deposited sediment is removed. The cost of maintenance shall be covered by Item 207.

FILTERS: Plastic filter fabric, as approved by the engineer, may be placed over the sand filter blanket on sediment dams. Such fabrice may be cleaned in lieu of replacement, when approved by the Engineer.

SIZE: A series of smaller basins or dams may be substituted for a larger basin or dam when approved by the Engineer.

BASIS OF PAYMENT:
Sediment Dams and Basins shall be paid for under Item 207 Cubic Yard Temporary benches, dikes, dams and sediment basins. Rock required shall be paid for under Item 601, Cubic Yard, Rock channel protection, Type C, w/o bedding.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

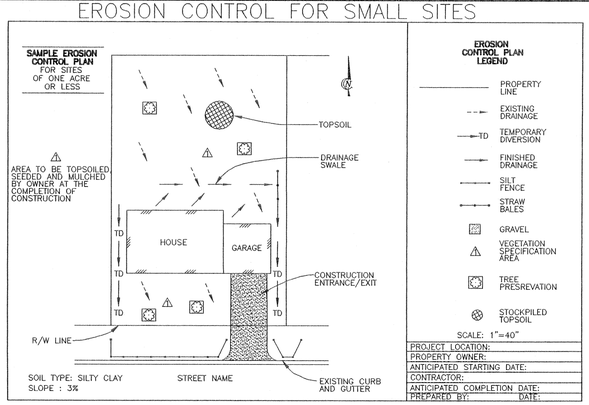
TEMPORARY EROSION CONTROL

STANDARD CONSTRUCTION DRAWING MC-11

Not to scale

15

EROSION CONTROL FOR SMALL SITES



WARNING! Extra measures may be needed if your site:
- Is within 300 feet of a stream or wetland
- Is within 1000 feet of a lake
- Is steep (slopes of 12% or more)
- Receives runoff from 10,000 sq. ft. or more of adjacent land
- Has more than an acre of disturbed ground

Typical Lawn Seed Mixtures

Grass	Sunny Site	Shady Site
Kentucky bluegrass	65%	15%
Fine fescue	20%	70%
Perennial ryegrass	15%	15%
Seeding rate		
Seeding rate (lb./1000 sq. ft.)	3-4	4-5

REVEGETATION
Seed, sod or mulch bare soil as soon as possible

1 SEEDING AND MULCHING
Spread 4 to 6 inches of topsoil.
Fertilize according to soil test (or apply 10 lb./1000 sq. ft. of 20-10-10 or 10-10-10 fertilizer.)
Seed with an appropriate mix for the site (see table.) Rake lightly to cover seed with 1/4" of soil. Roll lightly.
Mulch with straw (70-90 lb. or one bale per 1000 sq. ft.)
Anchor mulch by punching 2 inches into the soil with a dull, weighted disk or by using netting or other measures on steep slopes, or windy areas. Water gently every day or two to keep soil moist. Less watering is needed once grass is 2 inches tall.

2 SODDING Spread 4 to 6 inches of topsoil.
Fertilize according to soil test (or apply 10lb./1000 sq. ft. of 20-10-10 or 10-10-10 fertilizer.)
Lightly water the soil.
Lay sod. Tamp or roll lightly.
On slopes, lay sod starting at the bottom and work toward the top. Peg each piece down in several places.
Initial watering should wet soil 6 inches deep (or until water stands 1 inch deep in a straight-sided container.) Then water lightly every day or two for 2 weeks.

If construction is completed after October 31, seeding or sodding may be delayed. Applying mulch or temporary seed (such as rye or winter wheat) is recommended if weather permits. Straw bale or silt fences must be maintained until final seeding or sodding is completed in spring March 15- May 31.

3 PRESERVING EXISTING VEGETATION
Wherever possible, preserve existing trees, shrubs, and other vegetation.
To prevent root damage, do not grade, place soil piles, or park vehicles near trees marked for preservation.
Place plastic mesh or snow fence barriers around trees to protect the area below their branches.

4 or 5 STRAW BALE or SILT FENCE
Put up before any other work is done.
Install on downslope side(s) of site with ends extended up sideslopes a short distance.
Place parallel to the contour of the land to allow water to ond behind fence.
Entrench 4 inches deep (see back page.)
Stake (2 stakes per bale OR 1 stake every 3 feet for silt fence.)
Leave no gaps between bales or sections of silt fence. Inspect and repair once a week and after every 1/2 inch rain. Remove sediment if deposits reach half the fence or straw bale height.
Maintain until a lawn is established.

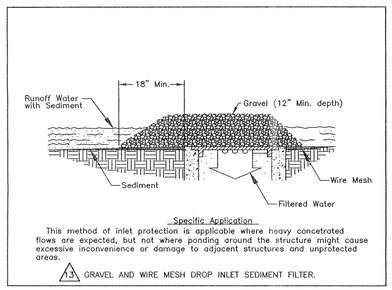
6 SOIL PILES
Located away from any downslope street, driveway, stream, lake, wetland, ditch or drainageway.
Temporary seed such as annual rye is recommended for topsoil piles.
Surround with straw bales or silt fence.

GRAVEL DRIVE
Install a single access drive using 3 to 5 inch aggregate over a geotextile material.
Lay gravel 6 inches deep and 10 feet wide from the foundation to the street.
Use to prevent tracking dirt onto the road by all vehicles.
Maintain throughout construction until driveway is paved.
Park all construction vehicles on the street and off of the site.

SEDIMENT CLEANUP
By the end of each work day, sweep or scrape up soil tracked onto the road.
By the end of the next work day after a storm, clean up soil washed off-site, and check straw bales and silt fence for damage or sediment buildup.

DOWNSPOUT EXTENDERS
Not required, but highly recommended.
Install as soon as gutters and downspouts are completed.
Route water to a grassed or paved area.
Maintain until a lawn is established.

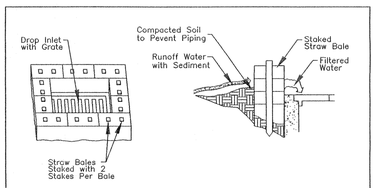
INLET PROTECTION DETAILS



Specific Application

This method of inlet protection is applicable where heavy concetrated flows are expected, but not where ponding around the structure might cause excessive inconvenience or damage to adjacent structures and unprotected areas.

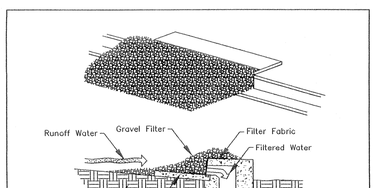
13 GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER.



SECIFIC APPLICATION

This method of inlet protection is applicable where the inlet drains a relatively flat area (slope no greater than 5 percent) where sheet or overland flows not exceeding 0.5 cfs) are typical.

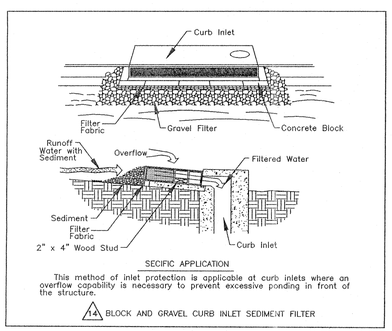
11 STRAW BALE DROP INLET SEDIMENT FILTER



SECIFIC APPLICATION

This method of inlet protection is applicable at curb inlets where ponding in front of the structure is not likely to cause inconvenience or damage to adjacent structures and unprotected areas.

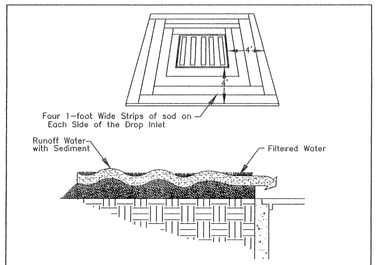
8 GRAVEL CURB INLET SEDIMENT FILTER



SECIFIC APPLICATION

This method of inlet protection is applicable at curb inlets where an overflow capability is necessary to prevent excessive ponding in front of the structure.

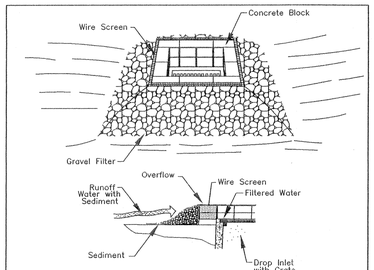
14 BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER



SECIFIC APPLICATION

This method of inlet protection is applicable only at the time of permanent seeding, to protect the inlet from sediment and mulch materials until permanent vegetation has become established.

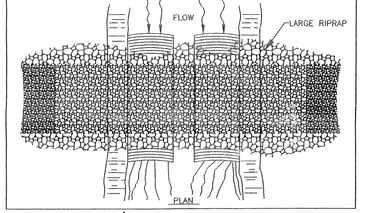
12 SOD DROP INLET SEDIMENT FILTER



SECIFIC APPLICATION

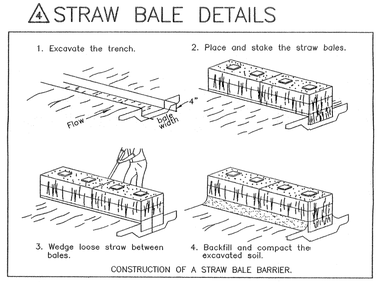
This method of inlet protection is applicable where heavy flows are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

9 BLOCK AND DROP INLET SEDIMENT FILTER



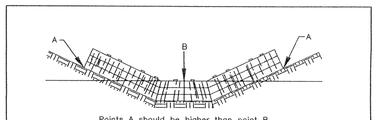
7 TEMPORARY STREAM CROSSING

4 STRAW BALE DETAILS



CONSTRUCTION OF A STRAW BALE BARRIER.

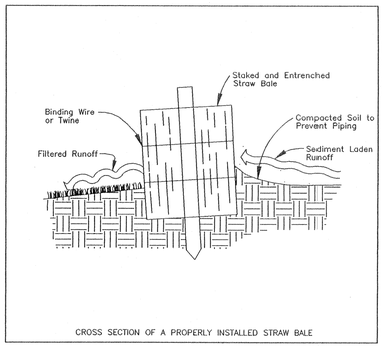
Source: Adapted from Installation of Straw and Filter Barriers for Sediment control, Sherwood and Wyant.



Points A should be higher than point B

PROPER PLACEMENT OF A STRAW BALE BARRIER IN DRAINAGE WAY

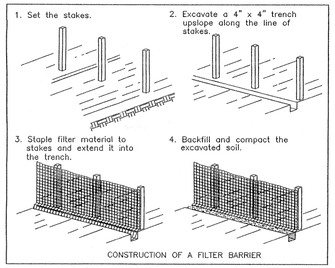
Source: Installation of Straw and Filter Barriers for Sediment Control, Sherwood and Wyant.



CROSS SECTION OF A PROPERLY INSTALLED STRAW BALE

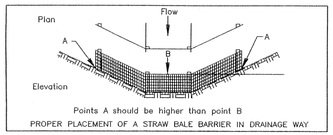
Source: Michigan Soil Erosion and Sedimet Control Guidebook, 1975

5 SILT FENCE DTEAILS



CONSTRUCTION OF A FILTER BARRIER

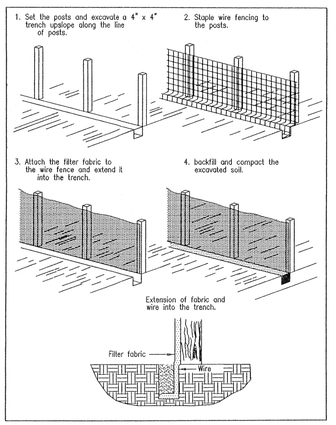
Source: Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant



Points A should be higher than point B

PROPER PLACEMENT OF A STRAW BALE BARRIER IN DRAINAGE WAY

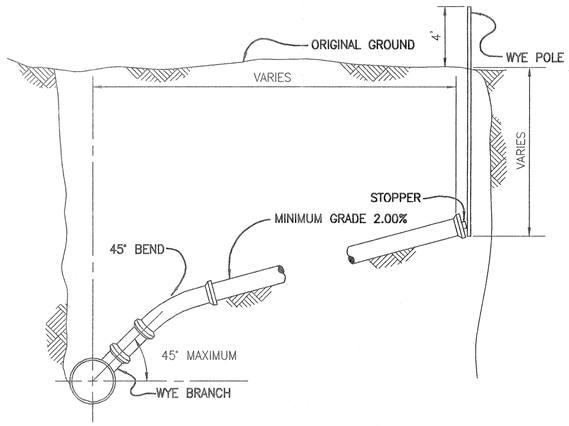
Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant



Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

engineers planners surveyors
bayer becker engineers
1230 belleview dr., lawrenceburg indiana 47025-1912
812-537-9064

D:\MCAD\BLOCKS\SOIL Tue Mar 04 15:26:36 1997 Drawn by: Tom Barrett

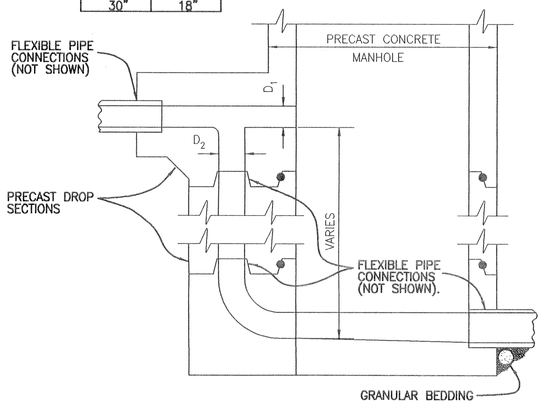


TYPICAL SERVICE CONNECTION

NO SCALE

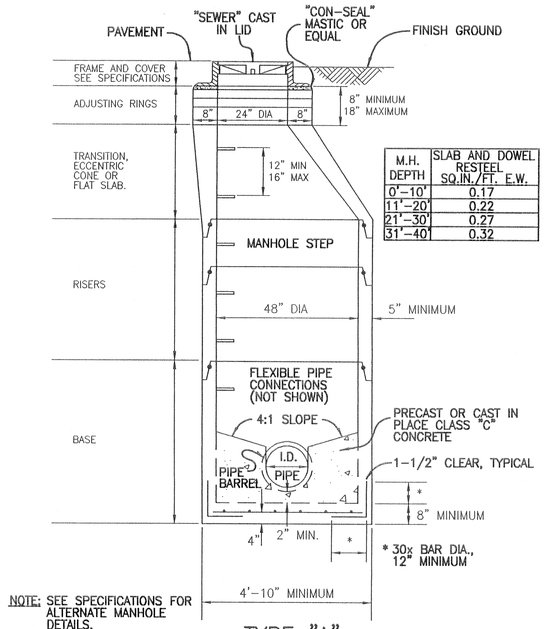
TABLE OF DIMENSIONS	
D_1	D_2 (MIN.)
6"	6"
8"	6"
10"	6"
12"	8"
15"	8"
18"	10"
21"	10"
24"	12"
27"	15"
30"	18"

DROP MANHOLES SHALL BE USED WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE INVERT OF THE INLET AND THE OUTLET PIPE EXCEEDS 2.0 FEET.



PRECAST DROP MANHOLE

NO SCALE

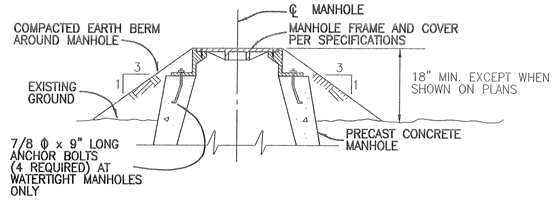


M.H. DEPTH	SLAB AND DOWEL RESTEEL SQ.IN./FT. E.W.
0'-10'	0.17
11'-20'	0.22
21'-30'	0.27
31'-40'	0.32

NOTE: SEE SPECIFICATIONS FOR ALTERNATE MANHOLE DETAILS.

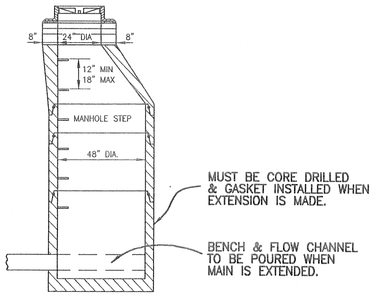
TYPE "A"
PRECAST CONCRETE MANHOLE

NO SCALE

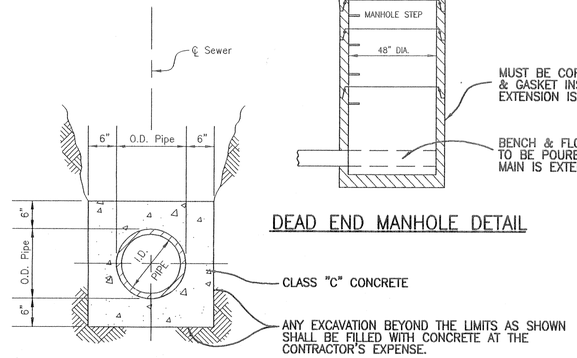


ELEVATED MANHOLE DETAIL

NO SCALE



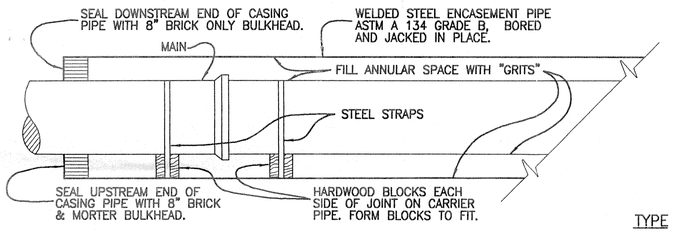
DEAD END MANHOLE DETAIL



CONCRETE ENCASEMENT

NO SCALE

NOTE: CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS DETAILING THE TYPE OF AUGER STOP TO BE USED AT EACH BORE AND JACK LOCATION.



LOCATION	①	②	③	SHEET NO.

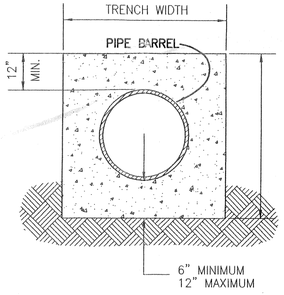
① ENCASEMENT PIPE SIZE
② ENCASEMENT PIPE WALL THICKNESS
③ MAIN SIZE

ENCASEMENT PIPE DETAIL

NO SCALE

MAXIMUM PIPE SIZE

TYPE	MH I.D.	MAX. PIPE SIZE	MIN. INTERIOR ANGLE
"A"	48"	24"	104°
"B"	60"	36"	116°
"C"	72"	42"	108°
"D"	84"	60"	135°

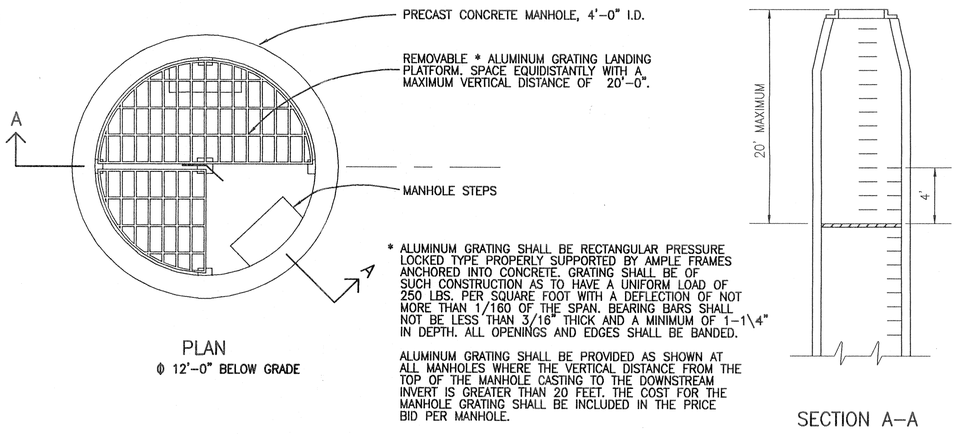


BEDDING MATERIAL

DIA.	AASHTO M-43
LESS THAN 15"	---- 67 7 or 8
15" - 30"	---- 6 or 67
MORE THAN 30"	---- 57 or 67

SEWER INSTALLATION

NO SCALE



PLAN
ϕ 12'-0" BELOW GRADE

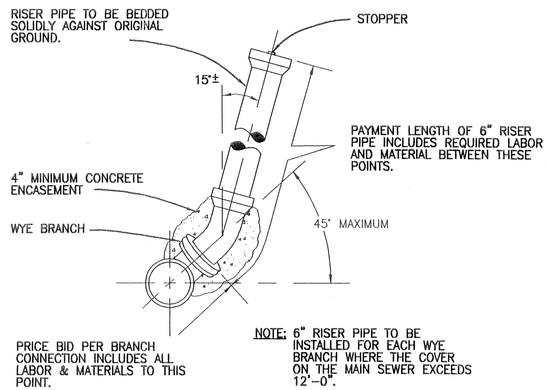
SECTION A-A

* ALUMINUM GRATING SHALL BE RECTANGULAR PRESSURE LOCKED TYPE PROPERLY SUPPORTED BY AMPLE FRAMES ANCHORED INTO CONCRETE. GRATING SHALL BE OF SUCH CONSTRUCTION AS TO HAVE A UNIFORM LOAD OF 250 LBS. PER SQUARE FOOT WITH A DEFLECTION OF NOT MORE THAN 1/160 OF THE SPAN. BEARING BARS SHALL NOT BE LESS THAN 3/16" THICK AND A MINIMUM OF 1-1\4" IN DEPTH. ALL OPENINGS AND EDGES SHALL BE BANDED.

ALUMINUM GRATING SHALL BE PROVIDED AS SHOWN AT ALL MANHOLES WHERE THE VERTICAL DISTANCE FROM THE TOP OF THE MANHOLE CASTING TO THE DOWNSTREAM INVERT IS GREATER THAN 20 FEET. THE COST FOR THE MANHOLE GRATING SHALL BE INCLUDED IN THE PRICE BID PER MANHOLE.

MANHOLE GRATING DETAIL

NO SCALE

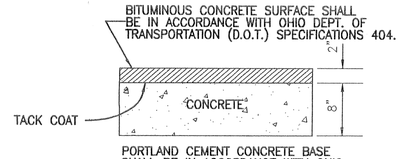


PRICE BID PER BRANCH CONNECTION INCLUDES ALL LABOR & MATERIALS TO THIS POINT.

NOTE: 6" RISER PIPE TO BE INSTALLED FOR EACH WYE BRANCH WHERE THE COVER ON THE MAIN SEWER EXCEEDS 12'-0".

DETAIL OF BRANCH CONNECTION AND RISER PIPE

NO SCALE



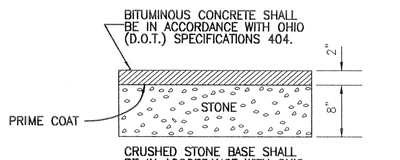
PORTLAND CEMENT CONCRETE BASE SHALL BE IN ACCORDANCE WITH OHIO D.O.T. SPECIFICATION 305.

TYPE "A"

NOTE: FOR TYPE "F" & "G" PAVEMENT REPLACEMENT DETAILS. SEE SHEET NO. 85.

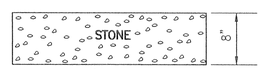
PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH OHIO D.O.T. SPECIFICATION 452.

TYPE "B"



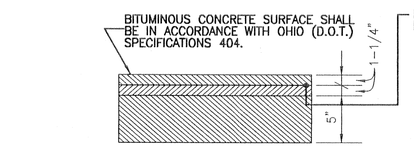
CRUSHED STONE BASE SHALL BE IN ACCORDANCE WITH OHIO (D.O.T.) SPECIFICATIONS 304.

TYPE "C"



CRUSHED STONE SHALL BE IN ACCORDANCE WITH OHIO (D.O.T.) SPECIFICATIONS 304.

TYPE "D"

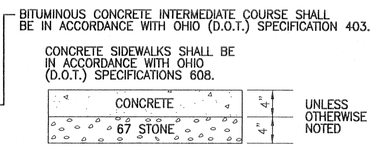


BITUMINOUS AGGREGATE BASE SHALL BE IN ACCORDANCE WITH OHIO (D.O.T.) SPECIFICATIONS 301.

TYPE "E"

PAVEMENT REPLACEMENT DETAILS

NO SCALE



WALK REPLACEMENT DETAIL

NO SCALE

D:\MCAD\BLOCKS\STADETLS Tue Mar 04 15:48:03 1997 Drawn by: Tom Barnett