SECTION 3

CONSTRUCTION PLANS

Preliminary Plan

A preliminary construction plan shall be prepared showing the feasibility of constructing a subdivision street system prior to recording the right-of-way with the County. This plan shall be drawn to a scale of no less than one inch equal one hundred feet (1"=100'). The plan shall show the following minimum data:

-Location map showing the relations of the proposed subdivision to existing state maintained highways. The plan shall be drawn to a scale of no less than one inch equal one mile (1"=1 mi.).

-Topography of the proposed subdivision. Topography shall extend beyond the limits of the subdivision to include, the proposed positive drainage outfall, critical features of the existing highway for a minimum distance of five hundred feet (500') beyond the proposed entrance location, and such other features as may be necessary in order to determine the feasibility of the project.

-Contours showing the common elevation of the existing ground within the limits of the topographic survey. The contour interval for various ground slopes shall be as follows:

Average Ground Slope	Contour Interval
less than 0.5%	0.5 feet
0.5% to 5.0%	1.0 feet
over 5%	2.0 feet

-Lot layout within the subdivisions showing their relationship to the proposed internal street system.

-Centerline stationing for the internal street system with the proposed horizontal and vertical alignments shown.

-Schematic drainage system with supporting preliminary drainage calculations to show the feasibility of the design.

-Location of the proposed intersection of the internal street system with the existing state maintained highway or subdivision streets. Turning lanes and bypass lanes to be constructed on the existing highway to serve the subdivision are to be shown to insure feasibility of the design.

Semi-Final Plans

Semi-final construction plans will be reviewed by the Department following the recordation of the subdivision by the County. The plans are to be prepared at the direction of the developer in accordance with the requirements of the Department. Four complete sets of the plans will be required for the review in addition to one copy of supporting calculations for the drainage design and other critical aspects of the design as determined by the Department.

To facilitate review of the plans, the centerline of all streets are to be physically located in the field with centerline stakes placed at 50 foot intervals. Drainage outfalls are to be located in order to determine the feasibility of the design.

Final Plans

The final construction plans are to include the revisions required by the Department. The plans are to include the signature and seal of the engineer or surveyor licensed to practice engineering in Delaware.

One set of the final plans are to be submitted for plan approval.

Construction Plan Checklist

Semi-Final and Final Construction plans shall be prepared in accordance with the following check list. The plans shall be prepared on 22"x36" mylar. Drafting work shall be neat and legible, suitable for half size reproduction. Plans which are not prepared in accordance with this check list shall not be approved for construction.

- TITLE SHEET
  (Figure III-1 shows a sample title sheet)

  1. Name of Subdivision.
  2. Section of the Subdivision or Name of the Streets to be considered by this plan.

3. Specify subdivision streets to be Public or Private.
4. General Location Map.
5. County in which Subdivision is located.
6. Total Sheets in Subdivision Street Construction Plan.
7. Plan view of entire Subdivision indicating streets to be constructed by this plan and their relation to all other streets within the Subdivision. Show North arrow for reference.
8. General Notes.
9. Index of sheets.
10. Legend of Utilities.
11. Summary of Quantities for streets to be constructed by this plan.
    a. Item Number and Name in accordance with State of Delaware Division of Highways Standard Specifications.
    b. Unit of Measurement.
    c. Total Quantity for each construction item.
12. Signature Block
    a. Seal of individual properly licensed in Delaware to perform the engineering and design for the preparation of construction plans for subdivision streets.
    b. Signature of Engineer and date.
    c. Signature of PS & E Engineer and date of approval. Approval applies only to the section of the subdivision being bonded.

- TYPICAL SECTION SHEETS

1. Typical Street Sections
    a. Typical Street Section is required for each major change of section.
    b. Width of street and shoulders.
    c. Cross slope of pavement, shoulders and side slopes.
    d. Point of Profile Grade Application.
    e. Type of curb.
    f. Depth and type of pavement material.
    g. Locations to place topsoil, seed and mulch.
    h. Underdrain where required by the Engineer.
    i. Subgrade to be prepared in accordance with Division of Highways Standard Specifications.
2. Typical Lateral Ditches and/or Outfall Ditches
    a. Width of ditch bottom.
    b. Point of Profile Grade Application (Ditches longer than 100 feet require a profile).
    c. Side slopes.
    d. Type and depth of ditch protection.
    e. Locations to place topsoil, seed and mulch.

3. Special Details
   a. Intersection roads.
   b. Superelevation diagrams (when required).
   c. Details of non-standard drainage structures.
   d. Driveway details.
4. Intersection Details
   a. Intersection radii with station and offsets to curve points.
   b. Location by station and offset to islands.
   c. Grade elevations at maximum interval of 25 feet on edge of islands and intersection radii.

- PLAN SHEET

1. Horizontal and Vertical Control Data
   a. Bench Marks: Maximum spacing 1000 feet. Show Elevation and Location.
   b. Centerline stationing and curve data.
   c. Survey references to horizontal control points.
   d. Bearings of centerline tangents.
   e. Stations of intersecting roads.
   f. Limits of construction.
   g. North arrow on each plan sheet.

2. Utilities
   Location of utility lines.

3. Drainage
   a. Location and elevations of parallel ditches every 50 feet.
   b. Location and type of ditch protection other than seed and mulch.
   c. Drainage flow arrows.
   d. Identify and locate drainage structures, storm sewers and culverts.
   e. Drainage Structures with invert elevations and elevations of top of grate or top of manhole cover.
   f. Culverts with invert elevations of inlet and outlet.
   g. Location, flow line, elevation, typical section and ditch protection for culvert or storm sewer outfall.
   h. Drainage data for culvert or storm sewer outfall to include:

      A = Drainage Area
      B = Estimated Flow for Design Storm
      C = Estimate Velocity of Design Flow

4. Traffic Control

The plans and estimates shall contain a tabulation of the required number of street name signs and development name signs.

5. Minimum scale for construction plans are 1"=50' Intersection details at 1" = 30'.

- PROFILE SHEET
  1. Where possible profile will be on same sheet as plan.
  2. Horizontal scale will be same as plan sheet. Vertical scale will generally be 1" = 5'.
  3. Vertical Curve Data: PVC, PVI, PVT, Length of Curve, PVI Elevation.
  4. Soil information when available - use exaggerated scale and indicate type and depth of material.
  5. Invert elevations of storm sewer lines at drainage structures.
  6. Show size, length, type and slope of storm sewer lines.

Cost Estimate

Following the approval of the final construction plan a cost estimate for the intended street construction will be reviewed. The cost estimate is to be prepared at the direction of the developer in accordance with the Department.

The summary of quantities for each segment of construction shall be shown on the title sheet of the construction plans. Each item of construction will be listed in accordance with the Standard Specifications of the Department. The method of measurement for each item is to be in accordance with the Standard Specifications.

The unit prices for each construction item is to be in accordance with the approved list of unit prices for subdivision street construction published by the Department from time to time. The following tabulation lists current approved unit prices.

PRICE LIST FOR COMPUTING THE SECURITY FOR SUBDIVISION STREET CONSTRUCTION

ITEM NO.	NAME	UNIT	UNIT COST
202	Excavation & Embankment	C.Y.	4.50
204	Muck Excavation	C.Y.	10.00
206	Rock Excavation for Structures and Trenches	C.Y.	35.00
208	Excavation & Backfill for Pipe Trenches	C.Y.	4.50
209	Borrow (Type F)	C.Y.	8.00
302	Select Borrow Base	C.Y.	9.00
304A	Pre-Mixed Base Course (CR-1) @ 1" Thickness	S.Y.	.80
401	Hot-Mix, Hot Laid Bituminous Concrete Pavement	Tons	35.00
404	Bituminous Surface Treatment		
	Coarse Aggregate	Tons	35.00
	Asphalt	Gal.	1.50
615	Reinforced Concrete Pipe		
	15"	L.F.	13.00
	18"	L.F.	16.00
	21"	L.F.	19.00
	24"	L.F.	22.00
	27"	L.F.	26.00
	30"	L.F.	30.00
	36"	L.F.	40.00
	42"	L.F.	50.00
616	Reinforced Concrete Elliptical Pipe		
	14"x23"	L.F.	20.00
	19"x30"	L.F.	25.00
	22"x34"	L.F.	30.00
	24"x38"	L.F.	35.00
	27"x42"	L.F.	40.00
617	Galvanized Corrugated Steel Pipe		
	15"	L.F.	15.00
	18"	L.F.	16.00
	21"	L.F.	18.00
	24"	L.F.	20.00
	27"	L.F.	24.00
	30"	L.F.	28.00
	36"	L.F.	32.00
	17"x13"	L.F.	14.00
	21"x15"	L.F.	17.00
	24"x18"	L.F.	20.00
	28"x20"	L.F.	25.00
	35"x24"	L.F.	32.00
	43"x27"	L.F.	40.00
	72"x44"	L.F.	60.00

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ITEM NO.	NAME	UNIT	UNIT COST
602	Flared End Sections For		
	15" R.C.P.	Each	150.00
	18" R.C.P.	Each	175.00
	21" R.C.P.	Each	200.00
	24" R.C.P.	Each	250.00
	27" R.C.P.	Each	300.00
620	Flared End Sections For		
	36" R.C.P.	Each	450.00
	42" R.C.P.	Each	550.00
	15" G.C.S.P.	Each	75.00
	18" G.C.S.P.	Each	100.00
	21" G.C.S.P.	Each	125.00
	24" G.C.S.P.	Each	175.00
	27" G.C.S.P.	Each	225.00
	30" G.C.S.P.	Each	275.00
	36" G.C.S.P.	Each	400.00
	42" G.C.S.P.	Each	550.00
	48" G.C.S.P.	Each	700.00
	17"x13" G.C.S.P.	Each	75.00
	21"x15" G.C.S.P.	Each	100.00
	24"x18" G.C.S.P.	Each	115.00
	28"x20" G.C.S.P.	Each	125.00
	35"x24" G.C.S.P.	Each	175.00
	43"x27" G.C.S.P.	Each	300.00
	72"x44" G.C.S.P.	Each	700.00
704	P.C.C. Gutter	S.Y.	25.00
705	P.C.C. Curb		
	Type 1	L.F.	8.00
	Type 2	L.F.	7.00
706	P.C.C. Parkway Curb		
	Type 1	L.F.	10.00
	Type 2	L.F.	8.00
	Type 3	L.F.	10.00
707	Integral P.C.C. Curb & Gutter		
	Type 2	L.F.	5.00
	Type 3	L.F.	7.00
708	P.C.C. Sidewalk		
	4"	S.F.	1.50
	6"	S.F.	2.50
711	Catch Basins		
	SD-1	Each	700.00
	SD-2A	Each	1,000.00
	SD-1A	Each	900.00
	Double SD-1A	Each	1,200.00
	J	Each	800.00
	Double J	Each	1,100.00
	J Modified	Each	1,000.00
	Double J Modified	Each	1,300.00
	PWBD-1	Each	800.00
	PWBD-2	Each	900.00
	PWBD-3	Each	1,000.00

ITEM NO. NAME UNIT UNIT COST

	PWBD-4	Each	1,100.00
	PWBD-2 Modified #1	Each	1,000.00
	PWBD-2 Modified #2	Each	1,100.00
	Type B	Each	600.00
	Lawn	Each	500.00
712	Manholes		
	Standard	Each	900.00
	Type A	Each	1,100.00
	Type B	Each	1,200.00
	Type C	Each	1,200.00
	Type D	Each	1,300.00
	Type W	Each	900.00
	Type W-30	Each	1,100.00
715	Galvanized Steel Beam Guard Rail	L.F.	16.00
716	Twisted End Anchorages	Each	700.00
722	Topsoil 4"	S.Y.	1.75
723	Topsoiling	S.Y.	1.00
724	Seeding	S.Y.	.25
726	Mulching	S.Y.	.15
727	Sodding	S.Y.	2.25
733	Rip Rap		
	Plain	S.Y.	30.00
	Grouted	S.Y.	35.00
736	Removal of Existing P.C.C. Pavement,		
	Curb, Sidewalk, Etc.	S.Y.	6.00
737	Perforated Pipe Underdrain	L.F.	8.00
738	Flagman	Hours	10.03
S.P.	Furnishing Borrow Type "C" for Pipe		
	and Utility Trench Backfill	C.Y.	7.00
S.P.	Sawing of Joints		
	Hot Mix	L.F.	2.00
	Concrete	L.F.	4.00
S.P	P.C.C. Valley Gutter - 8" Thick	S.Y.	28.00
S.P.	Signs		
	Stop	Each	85.00
	Warning	Each	75.00
	Speed	Each	75.00
	Development Name	Each	85.00
	Street Blades	Each	125.00
	Stop/Street Blades	Each	150.00