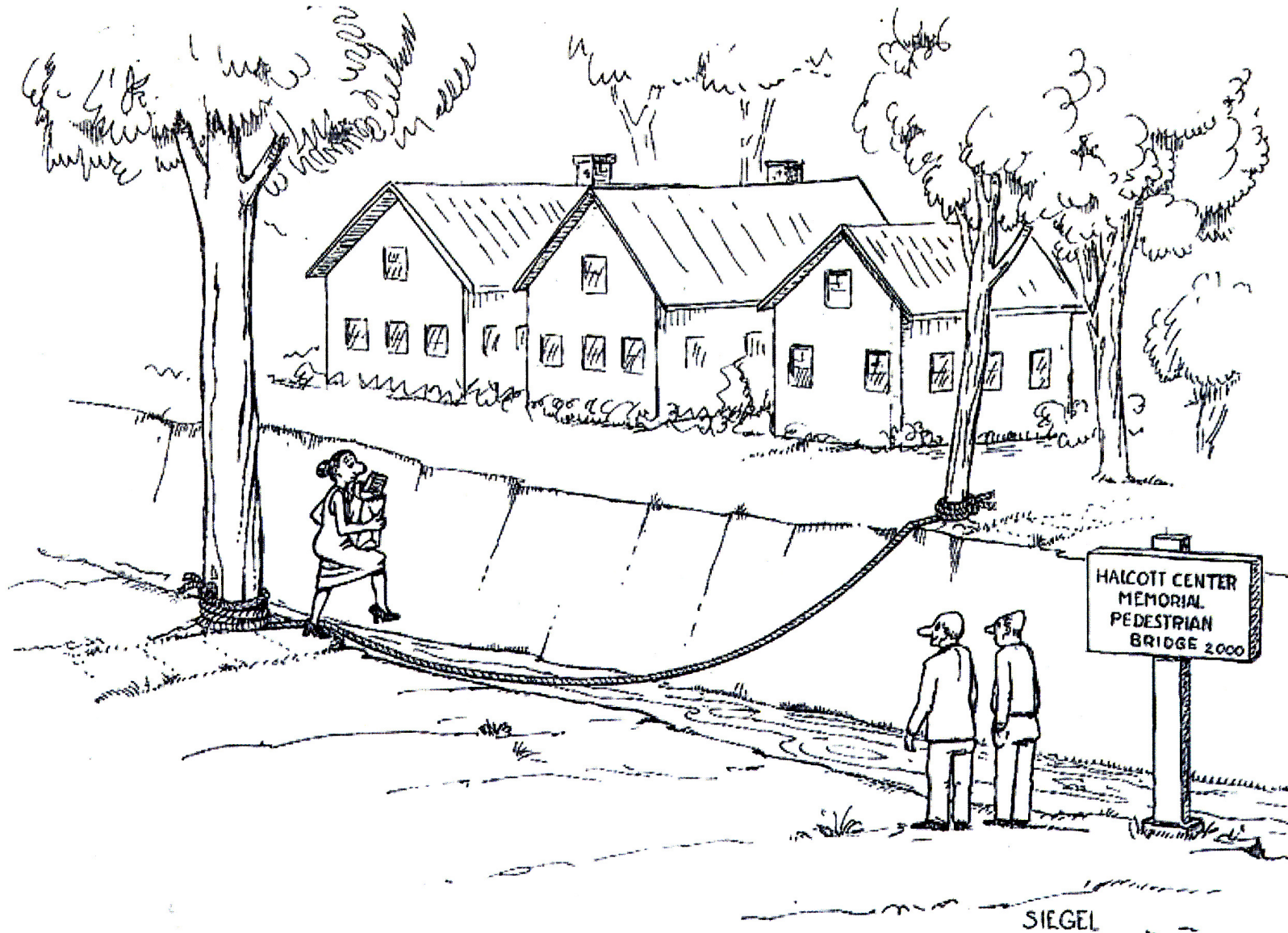


Cost Estimating



"Looks like Percy went with the low bidder again."

Types of Estimates

- Unit Cost
 - Each item/task identified and assigned a cost
 - Large items/tasks broken down into smaller pieces
 - Allows averaging of costs over multiple bids/suppliers
 - Allows quick evaluation of alternatives
 - Can get very long and tedious to review
- Lump Sum
 - Cost is an aggregate of a number of tasks
 - Allows large scale comparisons between design elements
 - Short form bidding
 - Difficult to swap out alternatives
 - Contractor can “hide” costs

Anatomy of a Unit Cost Estimate

ROADWAY, DRAINAGE AND SITE IMPROVEMENT PROJECT DESIGNER'S ESTIMATE

PROJECT: Griffith Street/South Boulevard Streetscape Improvements 512-04-011
 PLAN: 25% CD Set: Issued 4-19-04
 ESTIMATOR: HJK
 CHECKED BY: TRT

Item No.	Sect. No.	Item Description	Qty	Unit	Unit Price	Item Amount
General Site Work						
1	800	Mobilization	1	LS	\$0.00	\$0.00
2	226	Grading	1	LS	\$0.00	\$0.00
3	893	Erosion Control Allowance	1	LS	\$0.00	\$0.00
4	953	Traffic Control Plan Allowance	1	LS	\$0.00	\$0.00
Roadway						
5	920	Pavement Marking/Signing Allowance		LS	\$0.00	\$0.00
6	310	18" R.C. Pipe Culverts, Class III	0	LF	\$40.00	\$0.00
7	SP	4" Subdrain	0	LF	\$10.75	\$0.00

Unit Cost Sources

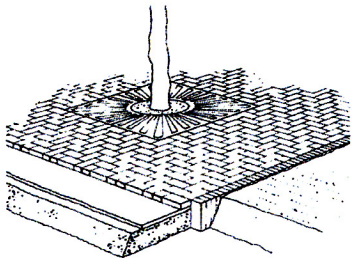
- Past Projects
 - Esp. for walls, paving, curbing, etc.
- Rules of Thumb
 - Furnishings: Wholesale Cost x 2
 - Planting: Wholesale Cost x 1.5-2.5
- Cost Data Books
 - *Building Construction Cost Data* (RS Means)

Unit Costs

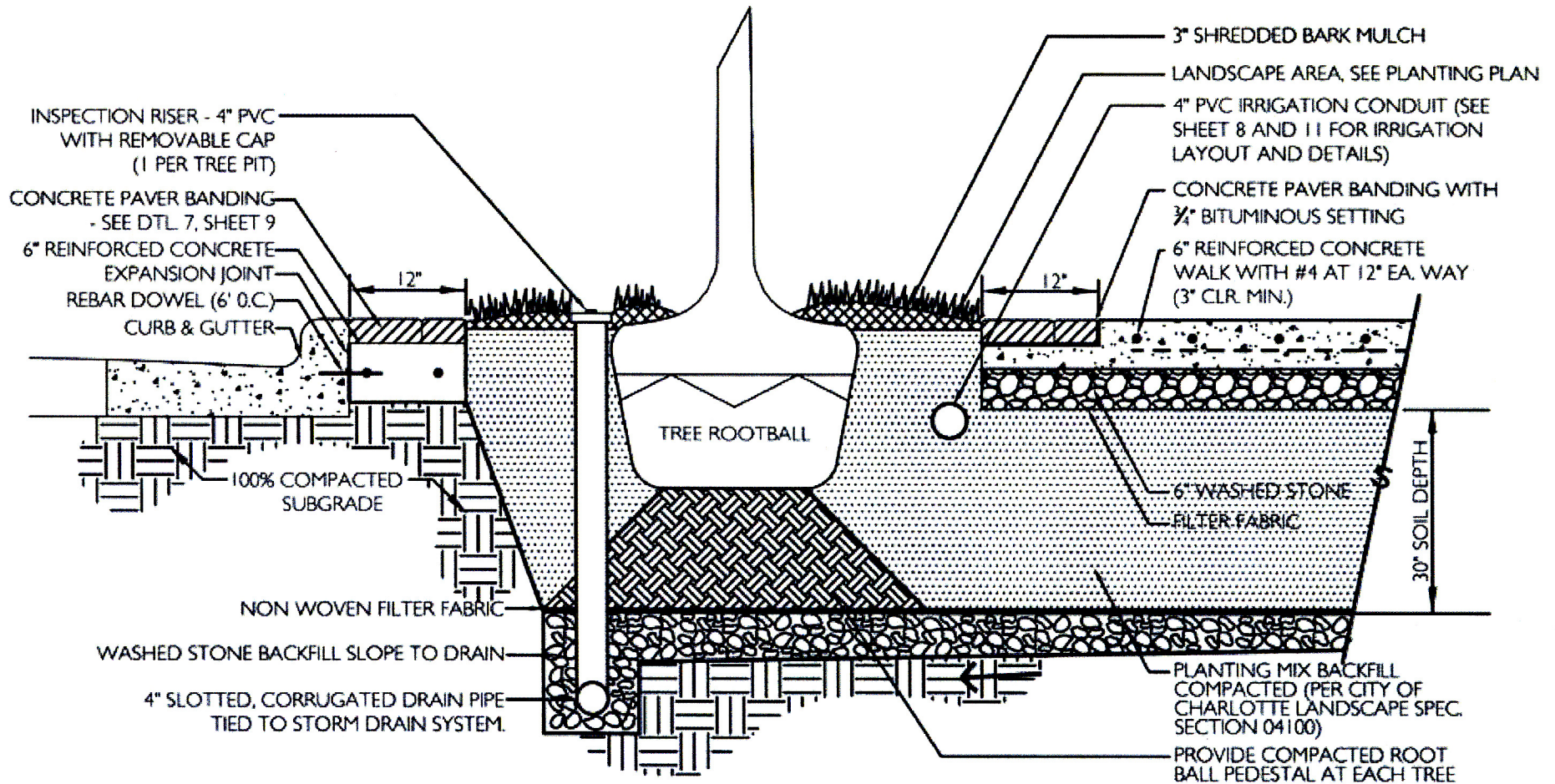
- Unit Cost = Material Cost + Labor Cost +



Building Construction Cost Data

SITE WORK	12.7-283	Brick & Tile Plazas
	<p>The Plaza Systems listed include several brick and tile paving surfaces on three different bases: gravel, slab on grade and suspended slab. The system cost includes this base cost with the exception of the suspended slab. The type of bedding for the pavers depends on the base being used, and alternate bedding may be desirable. Also included in the paving costs are edging and precast grating costs and where concrete bases are involved, expansion joints.</p>	

System Components	QUANTITY	UNIT	COST PER S.F.		
			MAT.	INST.	TOTAL
SYSTEM 12.7-283-2050					
PLAZA, BRICK PAVERS, 4" X 8" X 1-1/2", GRAVEL BASE, STONE DUST BED					
Compact subgrade, static roller, 4 passes	.111	S.Y.		.07	.07
Bank gravel, 2 mi haul, dozer spread	.012	C.Y.	.05	.05	.10
Compact gravel base, vibrating plate	.012	C.Y.		.01	.01
Grading fine grade, 3 passes with grader	.111	S.Y.		.29	.29
Stone dust, 1" thick, skid steer loader spread	.003	C.Y.	.04	.03	.07
Compact bedding, vibrating plate	.003	C.Y.			
Brick paver, 4" x 8" x 1-3/4"	4.150	Ea.	1.98	2.03	4.01
Brick edging, stood on end, 6 per L.F.	.060	L.F.	.14	.30	.44
Precast concrete tree grating, 1 per 250 S.F.	.004	Ea.	.81	.14	.95
TOTAL			3.02	2.93	5.95



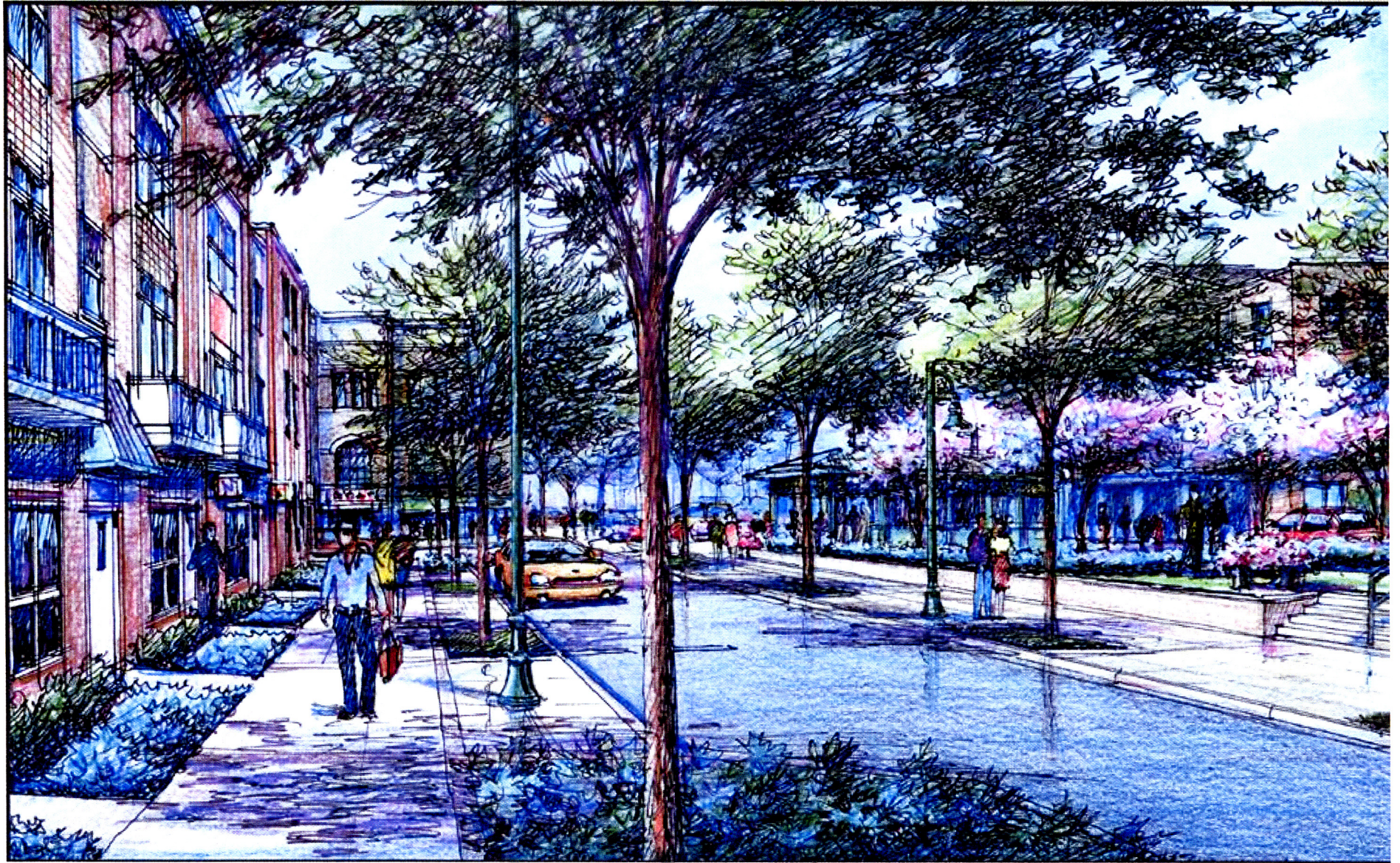
CITY SPECIFIED PLANTING MIX TO EXTEND TO LIMITS OF REINFORCED PAVING.
SEE SHEET 6 FOR LAYOUT AND LIMITS OF REINFORCED CONCRETE PAVING.

2 TREE PIT IN SIDEWALK
10 SECTION A

TREEPIT-01c
NOT TO SCALE

Building Construction Cost Data (1992)

12.7-283		Brick & Tile Plazas	COST PER S.F.		
			MAT.	INST.	TOTAL
1050	Plaza, asphalt pavers, 6" x 12" x 1-1/4", gravel base, asphalt bedding	5.70	4.90	10.60	
1100	Slab on grade, asphalt bedding	4.87	5	9.87	
1150	Suspended slab, insulated & mastic bedding	7.15	7.15	14.30	
1300	6" x 12" x 3", gravel base, asphalt, bedding	9.55	5.40	14.95	
1350	Slab on grade, asphalt bedding	6.15	5.15	11.30	
1400	Suspended slab, insulated & mastic bedding	8.40	7.30	15.70	
2050	Brick pavers, 4" x 8" x 1-1/2", gravel base, stone dust bedding	3.02	2.78	5.80	
2100	Slab on grade, asphalt bedding	3.92	3.34	7.26	
2150	Suspended slab, insulated & no bedding	6.35	5.55	11.90	
2300	4" x 8" x 2-1/4", gravel base, stone dust bedding	3.20	2.78	5.98	
2350	Slab on grade, asphalt bedding	4.24	3.43	7.67	
2400	Suspended slab, insulated & no bedding	6.50	5.55	12.05	
2550	Shale pavers, 4" x 8" x 2-1/4", gravel base, stone dust bedding	3.35	3.18	6.53	
2600	Slab on grade, asphalt bedding	4.39	3.83	8.22	
2650	Suspended slab, insulated & no bedding	4.18	3.90	8.08	
3050	Thin set tile, 4" x 4" x 3/8", slab on grade	4.50	3.11	7.61	
3300	4" x 4" x 3/4", slab on grade	6	3.04	9.04	
3550	Concrete paving stone, 4" x 8" x 2-1/2", gravel base, sand bedding	3	2.99	5.99	
3600	Slab on grade, asphalt bedding	3.79	3.38	7.17	
3650	Suspended slab, insulated & no bedding	3.58	3.45	7.03	
3800	4" x 8" x 3-1/4", gravel base, sand bedding	3.15	3.17	6.32	
3850	Slab on grade, asphalt bedding	3.94	3.56	7.50	



Process: Takeoffs



- Itemize all items on plan
- Account for unstated items

Units

- Typical Units
 - Paving: SF or SY
 - Walls: FF, occasionally LF or CY
 - Soil: CY
 - Aggregate: CY or TN
 - Grading: A or LS
 - Curbing: LF
 - Plants: EA
 - Plant Beds: SF or SY

Abbreviations

A: Acres

EA: Each

CY: Cubic Yards

FF: Face Feet

LF: Linear Feet

LS: Lump Sum

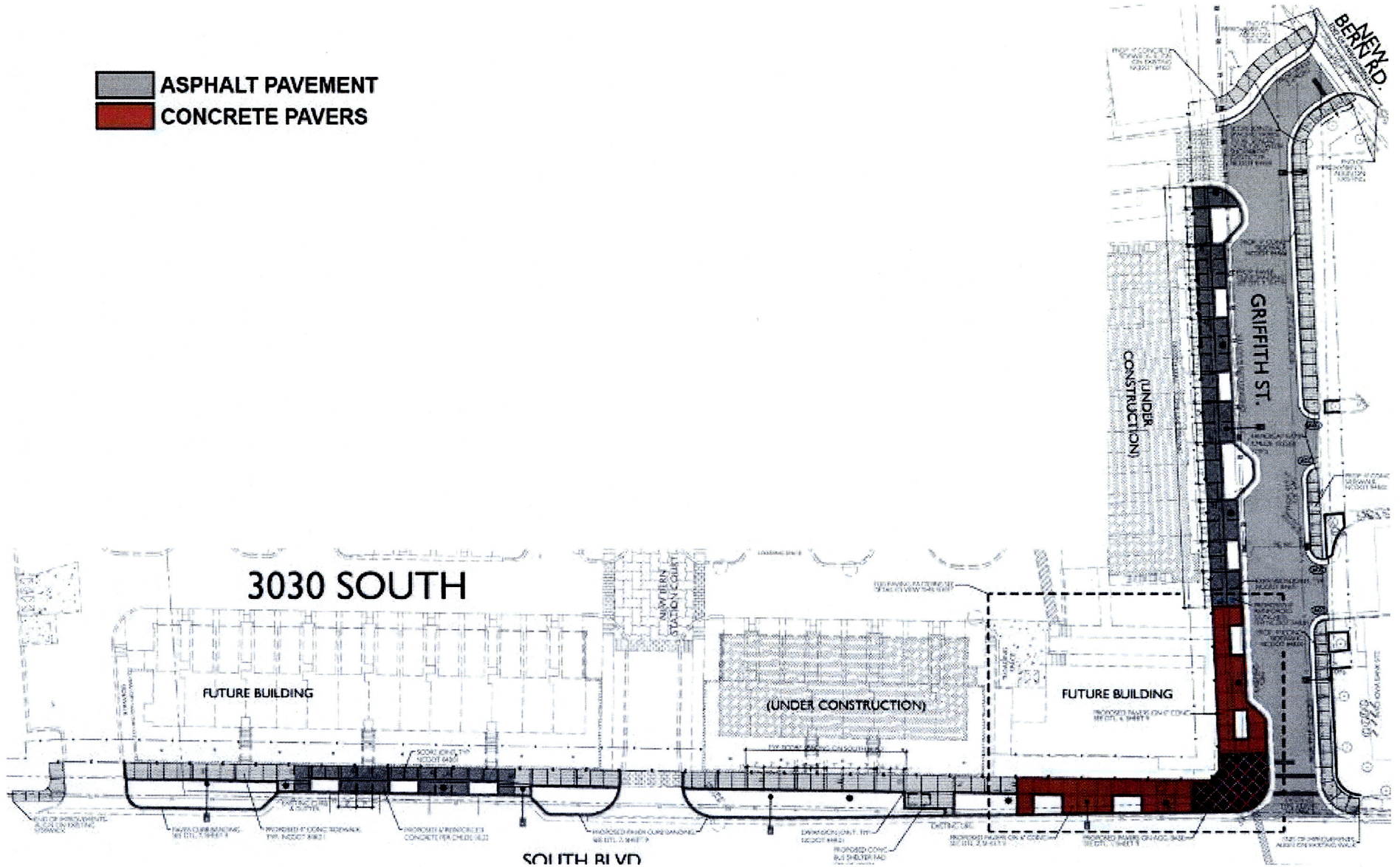
SF: Square Feet

SY: Square Yards

TN: Tons

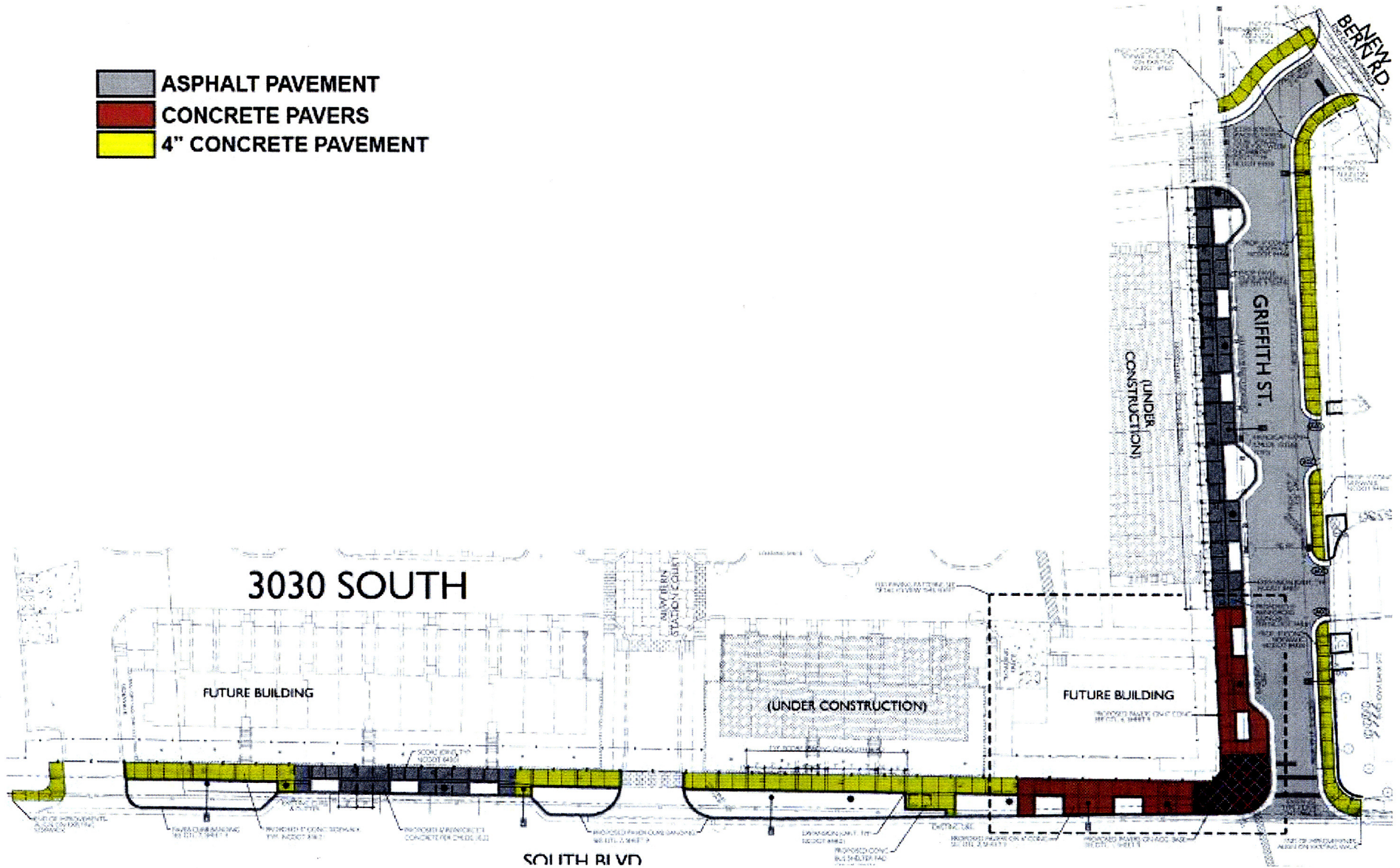
Process-Takeoffs

- ASPHALT PAVEMENT
- CONCRETE PAVERS



Process-Takeoffs

- ASPHALT PAVEMENT
- CONCRETE PAVERS
- 4" CONCRETE PAVEMENT



Contingency

- Depends on Phase of Project (implied accuracy of information)
 - Planning: 15%
 - Design Development: 10%
 - Detailed Design: 5%
 - Construction Documents: 3%

Design Fees

- Used during planning/DD phases to determine future fees
- Construction Document Production
 - Architecture/Engineering Fees: 5% to 15%
 - Landscape Architecture: 2.5% to 10%
- Construction Administration
 - 10% Design Fees

Typical Mistakes

- False confidence in computers
 - CAD and Excel
- Inconsistent plans (particularly labeling)
- Errors in Takeoffs
 - Sloppy measurement
 - Not all items accounted for
- Old prices
- Time Influenced Errors

Suggestions, Tips, Hints

- Learn MS Excel
- BEFORE starting, make sure plan is to scale
- Visualize construction sequence
- Know your details
- Measure carefully
- Use consistent units
- Verify what costs include (esp. with suppliers)
- Group like items together
- Use marker/highlighter to verify you get everything

ROADWAY, DRAINAGE AND SITE IMPROVEMENT PROJECT
DESIGNER'S ESTIMATE

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2	226 Grading	1	LS	\$38,000.00	\$38,000.00
3	893 Erosion Control Allowance	1	LS	\$5,000.00	\$5,000.00
4	953 Traffic Control Plan Allowance	1	LS	\$18,000.00	\$18,000.00
Roadway					
5	920 Pavement Marking/Signing Allowance	1	LS	\$3,000.00	\$3,000.00
6	310 18" R.C. Pipe Culverts, Class III	56	LF	\$40.00	\$2,240.00
7	SP 4" Subdrain	710	LF	\$10.75	\$7,632.50
8	610 Asphalt Paving	8,100	SF		
9	610 Bituminous Concrete Base Course, 8" Type B25.0B	159	TN	\$52.00	\$8,255.52
10	610 Bituminous Concrete Intermediate Course, 2" Type I19.0B	40	TN	\$54.00	\$2,143.26
11	610 Bituminous Concrete Surface Course, 1" Type S9.5B	20	TN	\$56.00	\$1,111.32
12	620 Asphalt Binder for Plant Mix (PG 64-22)	10	TN	\$200.00	\$1,996.41
13	810 Pipe Removal	40	LF	\$12.00	\$480.00
14	840 Frame with Grate, Std. 840.03	2	EA	\$325.00	\$650.00
15	846 2'-6" Concrete Curb and Gutter	390	LF	\$12.50	\$4,875.00
16	858 Adjustment of Manholes	1	EA	\$350.00	\$350.00
	858 Adjustment of Meter Boxes or Valve Boxes	5	EA	\$225.00	\$1,125.00
Sidewalk					
18	848 Concrete Sidewalk, 4"	439	SY	\$35.00	\$15,365.00
19	848 Concrete Sidewalks, 6" Reinforced	534	SY	\$40.00	\$21,360.00
20	SP Concrete Pavers on 8" ABC	3,200	SF	\$12.00	\$38,400.00
21	SP Paver Edge Restraint (Plastic Edging)	65	LF	\$3.00	\$195.00
22	848 Concrete Wheelchair Ramps	20	SY	\$40.00	\$800.00
Landscape Improvements					
23	SP Large Deciduous Trees	16	EA	\$360.00	\$5,760.00
24	SP Small Flowering Trees	11	EA	\$150.00	\$1,650.00
25	SP Shrubs	223	EA	\$40.00	\$8,920.00
26	SP Shrub Bed Preparation (18" depth)	1,700	SF	\$2.25	\$3,830.00
27	SP Annuals / Groundcover Beds (Materials and Preparation)	2,100	SF	\$3.00	\$6,300.00
28	SP Pine Bark Mulch, 3" depth	35	CY	\$40.00	\$1,410.00
29	SP Amended Soil, 36" depth, Tree Wells Only	500	CY	\$40.00	\$20,000.00
30	SP Amended Soil, 24" depth, Plant Beds Only	250	CY	\$40.00	\$10,000.00
31	SP Lawn-Sod (Material Only)	850	SF	\$1.00	\$850.00
32	SP Fine Grading, Lawn Areas Only	94	SY	\$2.00	\$190.00
	SP Irrigation System (from JM Design Estimate)	1	LS	\$31,000.00	\$31,000.00
Site Furnishings					
34	SP Street Lights, City Std. Deluxe Acorn, 16' Pole, 175 W Fixture, incl. base	9	EA	\$3,000.00	\$27,000.00
35	SP Street Lights, City Std. Cobra Head, Black Metal Pole, 175 W Fixture, incl. base	5	EA	\$5,499.00	\$27,500.00
36	SP Trash receptacle	2	EA	\$750.00	\$1,500.00

Subtotal	\$329,889.01
3% Contingency	\$9,896.67
Contract Sum	\$339,785.68

SAY **\$340,000**