



APPENDIX 9:

Study-Derived Unit Costs

Estimate Classification and Methodology

This cost estimate as prepared is considered a Class 5 estimate as defined by the Association for the Advancement of Cost Engineering International (AACEI).

The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final cost of the project will depend upon the actual labor and material costs, competitive market conditions, final project costs, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure This Cost Estimate is based primarily on the use of conceptual and stochastic costs and some detailed items using separate Labor, Materials and Equipment costs. The estimate uses parametric costs where design information or The user should be cautioned that material prices are volatile as a result of current market conditions.

Key Assumptions

- Contractor will have adequate site access
- Client will reimburse the cost of any security vetting required of staff and construction craft
- There will be no liquidated damages
- No dewatering or subsurface enhancement will be required
- Site security and clearances for construction craft and professionals will be provided using owner resources, and

Exclusions

- Non-construction or soft costs for design, services during construction, land, legal and owner administration
- Hazardous material abatement
- Changes to the project location, routing, or schedule due to obstructions
- Schedule delays due to inclement weather or other natural causes
- Schedule delays due to other site operations
- Contractor General Conditions
- Contractor Mobilization
- Escalation

Estimate Validity

This estimate was prepared based on project scope details available at the time it was produced. As with all estimates it represents a snapshot in time of what is known about the project and expected to occur. The commodities and energy markets are extremely active at this point in time. Changes in either will have dramatic affects to this estimate. Therefore, this estimate should be viewed in that light and if more than 90 days have

Disclaimer

The opinions of cost (estimates) shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. The recent increases or decreases in material pricing may have a significant impact which is not predictable and careful review or consideration must be used in evaluation of material prices. As a result, the final project costs will vary from the opinions of cost presented herein. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding

Washington State Department of Transportation Airport Investment Study
 Typical Project Unit Cost Matrix

1. Pavement Projects

Airfield Pavement										
Preventative Localized Maintenance Unit Cost										
Asphalt Concrete (AC) Pavements										
Description	Unit	< 12,500 lbs			12,500 to 60,000 lbs		60,000 to 100,000 lbs		> 100,000 lbs	
		West	East	West	East	West	East	West	East	
AC Patch- Deep	SF	\$35.91	\$31.96	\$47.51	\$42.70	\$49.24	\$44.44	\$44.13	\$40.18	APMS
AC Patch- Partial	SF	\$30.02	\$27.29	\$30.02	\$27.29	\$30.02	\$27.29	\$30.02	\$27.29	APMS
Crack Sealing	LF	\$0.83	\$0.79	\$0.83	\$0.79	\$0.83	\$0.79	\$0.83	\$0.79	APMS
Portland Cement Concrete (PCC) Pavements										
Description	Unit	< 12,500 lbs			12,500 to 60,000 lbs		60,000 to 100,000 lbs		> 100,000 lbs	
		West	East	West	East	West	East	West	East	
Slab Replacement	SF	\$18.57	\$17.10	\$29.56	\$29.11	\$34.23	\$32.36	\$40.74	\$43.52	APMS
Full Depth Patch	SF	\$48.06	\$42.61	\$78.45	\$74.42	\$84.61	\$79.28	\$125.88	\$107.76	APMS
Partial Depth Patch	SF	\$26.03	\$23.62	\$26.03	\$23.62	\$26.03	\$23.62	\$26.03	\$23.62	APMS
Crack Sealing	LF	\$6.62	\$5.92	\$6.62	\$5.92	\$6.62	\$5.92	\$6.62	\$5.92	APMS
Joint Sealing (Bituminous)	LF	\$6.62	\$5.92	\$6.62	\$5.92	\$6.62	\$5.92	\$6.62	\$5.92	APMS
Global Maintenance Unit Cost										
Asphalt Concrete (AC) Pavements										
Description	Unit	< 12,500 lbs			12,500 to 60,000 lbs		60,000 to 100,000 lbs		> 100,000 lbs	
		West	East	West	East	West	East	West	East	
Fog Seal	SF	\$0.18	\$0.17	\$0.18	\$0.17	\$0.18	\$0.17	\$0.18	\$0.17	APMS
Slurry Seal	SF	\$1.14	\$1.01	\$1.14	\$1.01	\$1.14	\$1.01	\$1.14	\$1.01	APMS
Major Rehabilitation Unit Cost										
Description	Unit	< 12,500 lbs			12,500 to 60,000 lbs		60,000 to 100,000 lbs		> 100,000 lbs	
		West	East	West	East	West	East	West	East	
AC Overlay	SF	\$1.40	\$1.37	\$1.91	\$1.88	\$1.91	\$1.88	\$2.55	\$2.50	APMS
AC Reconstruction	SF	\$16.93	\$17.26	\$31.57	\$31.83	\$35.36	\$35.29	\$45.42	\$43.44	APMS
PCC Reconstruction	SF	\$6.92	\$9.37	\$14.58	\$16.58	\$16.16	\$21.36	\$15.10	\$18.50	APMS

Roadway Pavement						
Preventative Localized Maintenance Unit Cost						
Asphalt Concrete (AC) Pavements						
Description	Unit	Perimeter		Main Entrance		
		West	East	West	East	
AC Patch- Deep	SF	\$26.93	\$23.97	\$35.91	\$31.96	From Above < 12,500 lbs
AC Patch- Partial	SF	\$22.52	\$20.47	\$30.02	\$27.29	From Above < 12,500 lbs
Crack Sealing	LF	\$0.62	\$0.59	\$0.83	\$0.79	From Above < 12,500 lbs
Portland Cement Concrete (PCC) Pavements						
Description	Unit	Perimeter		Main Entrance		
		West	East	West	East	
Slab Replacement	SF	\$13.93	\$12.83	\$18.57	\$17.10	From Above < 12,500 lbs
Full Depth Patch	SF	\$36.05	\$31.96	\$48.06	\$42.61	From Above < 12,500 lbs
Partial Depth Patch	SF	\$19.52	\$17.72	\$26.03	\$23.62	From Above < 12,500 lbs
Crack Sealing	LF	\$4.97	\$4.44	\$6.62	\$5.92	From Above < 12,500 lbs
Joint Sealing (Bituminous)	LF	\$4.97	\$4.44	\$6.62	\$5.92	From Above < 12,500 lbs
Global Maintenance Unit Cost						
Asphalt Concrete (AC) Pavements						
Description	Unit	Perimeter		Main Entrance		
		West	East	West	East	
Fog Seal	SF	\$0.18	\$0.17	\$0.18	\$0.17	From Above < 12,500 lbs
Slurry Seal	SF	\$1.14	\$1.01	\$1.14	\$1.01	From Above < 12,500 lbs
Major Rehabilitation Unit Cost						
Description	Unit	Perimeter		Main Entrance		
		West	East	West	East	
AC Overlay	SF	\$1.05	\$1.03	\$1.40	\$1.37	From Above < 12,500 lbs
AC Reconstruction	SF	\$12.70	\$12.95	\$16.93	\$17.26	From Above < 12,500 lbs
PCC Reconstruction	SF	\$5.19	\$7.03	\$6.92	\$9.37	From Above < 12,500 lbs

2. Facilities Projects

New Facility Construction Unit Cost								
Description	Unit	General Aviation		Reliever		Commercial Service		
		West	East	West	East	West	East	
Terminal Building	SF	\$266.80	\$242.55	\$357.73	\$325.21	\$513.82	\$467.11	M&S 14-571
T-Hangar	SF	\$31.47	\$28.61	\$39.89	\$36.26	\$43.07	\$38.43	M&S 14-409
Corporate Hangar	SF	\$47.85	\$43.50	\$90.40	\$82.18	\$134.38	\$119.88	M&S 14-329
ARFF Building	SF	\$167.34	\$152.13	\$221.95	\$201.77	\$308.32	\$280.29	M&S 15-322 ACS
General Office Building	SF	\$187.08	\$170.07	\$248.12	\$225.57	\$313.35	\$284.86	M&S 15-344
Tower (Height based)	SF	\$474.80	\$431.64	\$602.04	\$547.31	\$796.24	\$710.33	M&S 14-40
Cargo Facilities/Hangar	SF	\$67.65	\$61.50	\$97.34	\$88.49	\$104.28	\$93.02	M&S 14-328
Air Craft Maintenance	SF	\$47.85	\$43.50	\$90.40	\$82.18	\$134.38	\$119.88	M&S 14-329
Air Craft Assembly/Manufacturing	SF	\$179.94	\$163.58	\$279.56	\$254.15	\$294.17	\$262.43	M&S 14-495
Facility Rehabilitation Unit Cost								
Description	Unit	General Aviation		Reliever		Commercial Service		
		West	East	West	East	West	East	
Terminal Building	SF	\$120.06	\$109.15	\$160.98	\$146.34	\$231.22	\$210.20	Used 45% of New Construction Cost from above
T-Hangar	SF	\$14.16	\$12.87	\$17.95	\$16.32	\$19.38	\$17.29	Used 45% of New Construction Cost from above
Corporate Hangar	SF	\$21.53	\$19.57	\$40.68	\$36.98	\$60.47	\$53.94	Used 45% of New Construction Cost from above
ARFF Building	SF	\$75.30	\$68.46	\$99.88	\$90.80	\$138.75	\$126.13	Used 45% of New Construction Cost from above
General Office Building	SF	\$84.19	\$76.53	\$111.66	\$101.50	\$141.01	\$128.19	Used 45% of New Construction Cost from above
Tower (Height based)	SF	\$213.66	\$194.24	\$270.92	\$246.29	\$358.31	\$319.65	Used 45% of New Construction Cost from above
Cargo Facilities/Hangar	SF	\$30.44	\$27.67	\$43.80	\$39.82	\$46.92	\$41.86	Used 45% of New Construction Cost from above
Air Craft Maintenance	SF	\$21.53	\$19.57	\$40.68	\$36.98	\$60.47	\$53.94	Used 45% of New Construction Cost from above
Air Craft Assembly/Manufacturing	SF	\$80.97	\$73.61	\$125.80	\$114.37	\$132.38	\$118.09	Used 45% of New Construction Cost from above

3. Electrical/Lighting/Signage/Pavement Marking Projects

Electrical/Lighting/Signage/Pavement Marking Unit Cost				
Description	Unit	West	East	
1 Module Guidance Sign, Installed Complete	EA	\$3,570.00	\$3,177.30	Elect Tab
2 Module Guidance Sign, Installed Complete	EA	\$5,010.00	\$4,458.90	Elect Tab
3 Module Guidance Sign, Installed Complete	EA	\$6,435.00	\$5,727.15	Elect Tab
4 Module Guidance Sign, Installed Complete	EA	\$7,865.00	\$6,999.85	Elect Tab
Runway Distance Remaining Sign	EA	\$4,710.00	\$4,191.90	Elect Tab
Runway Edge Light	EA	\$3,830.00	\$3,408.70	Elect Tab
Taxiway Edge Light	EA	\$3,830.00	\$3,408.70	Elect Tab
Obstruction Light	EA	\$4,200.00	\$3,738.00	Elect Tab
Runway End Identifier Light	EA	\$6,970.95	\$6,204.15	Elect Tab
Runway Threshold Light	EA	\$2,978.60	\$2,650.95	Elect Tab
Install 1-Way, 2-Inch PVC in CLSM	LF	\$37.50	\$33.38	Elect Tab
Install Cable, 1/C #8, 19 Strand, 5000V,	LF	\$2.16	\$1.92	Elect Tab
Install Cable, 1/C #8, 600V, Green Insulated Ground	LF	\$1.77	\$1.58	Elect Tab
Instrument Landing System (ILS)	EA			* * These items have too much variability to assign a unit cost and will need to be estimated on a project specific basis.
VOR, NDB, DME, or GPS	EA			* * These items have too much variability to assign a unit cost and will need to be estimated on a project specific basis.
MALSR, MALSF, MALS	EA			* * These items have too much variability to assign a unit cost and will need to be estimated on a project specific basis.
Precision Approach Path Indicator (PAPI)	EA			* * These items have too much variability to assign a unit cost and will need to be estimated on a project specific basis.

Area	Assembly Description	Takeoff Quantity	Total Cost/Unit
04Di150	4" DIP Water Class 50		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	37.04 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	12.24 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	12.24 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.69 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	24.07 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	12.96 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	37.04 cy	30.19 /cy
	31510 Water Distribution (Domestic or Fire)		
Water supply distribution piping, ductile iron, cement lined, tyton push-on joint, fittings, 18' lengths, 4" diameter, class 50, excludes excavation backfill	100.00 lf	31.75 /lf	
Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 4" diameter, class 50 water piping	1.00 ea	795.50 /ea	
Water Distribution (Domestic or Fire)	100.00 lf	39.71 /lf	
	100.00 LF	50.89 /LF	
06Di150	6" DIP Water Class 50		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	37.04 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	12.24 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	12.24 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.68 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	24.07 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	12.96 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	37.04 cy	30.19 /cy
	31510 Water Distribution (Domestic or Fire)		
Water supply distribution piping, ductile iron, cement lined, tyton push-on joint, fittings, 18' lengths, 6" diameter, class 50, excludes excavation backfill	100.00 lf	34.31 /lf	
Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 6" diameter, class 50 water piping	1.00 ea	1,146.81 /ea	
Water Distribution (Domestic or Fire)	100.00 lf	45.78 /lf	
	100.00 LF	56.96 /LF	
06Pv150	6" PVC Water Class 50		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	37.04 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	12.24 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	12.24 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.67 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	24.07 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	12.96 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	37.04 cy	30.19 /cy
	31510 Water Distribution (Domestic or Fire)		
Water supply distribution piping, piping polyvinyl chloride, 6" diameter, awwa c900, class 150, sdr 18, excludes excavation backfill, unless specified	100.00 lf	9.98 /lf	
Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 6" diameter, class 50 water piping	1.00 ea	1,146.80 /ea	
Water Distribution (Domestic or Fire)	100.00 lf	21.45 /lf	
	100.00 LF	32.63 /LF	
08Fire	8" Fire Hydrant Assembly		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/8 C.Y. excavator, 1' to 4' deep, excludes sheeting or dewatering	3.70 bcy	11.20 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	2.34 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	2.34 ecy	6.26 /ecy
	Backfill, light soil, by hand, no compaction	1.24 lcy	36.85 /lcy
	Backfill and compact, by hand, 12" layers, compaction in layers, vibrating plate, add to above	1.24 ecy	6.41 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	2.47 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	3.70 unit	63.43 /unit
	31510 Water Distribution (Domestic or Fire)		
Water supply distribution piping, ductile iron pipe, cement lined, mechanical joint, fittings, 18' lengths, 8" diameter, class 50, excludes excavation backfill	10.00 lf	58.25 /lf	
Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 8" diameter, class 50 water piping	1.00 ea	1,709.86 /ea	
Thrust blocks, 1.5' x 1.5' x 1.5'd, .125 CY per each	2.00 ea	96.26 /ea	
Water Utility Distribution Fire Hydrants, two way, 4'-0" depth, 5 - 1/4" valve, includes mechanical joints, excludes excavation and backfill	1.00 ea	2,781.15 /ea	
UVLT.prc cnc.hnd hol.igh dty,1-1/2",1'-0"2'-0"1'-9"d, exc exc and bckfl	1.00 ea	948.32 /ea	
Water supply distribution piping, butterfly valves cast iron, with extension box, 8" diameter	1.00 ea	1,897.15 /ea	
Water Distribution (Domestic or Fire)	10.00 lf	811.15 /lf	
	1.00 EA	8,346.46 /EA	
08Pv100	8" PVC Sanitary SDR35		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/8 C.Y. excavator, 1' to 4' deep, excludes sheeting or dewatering	3.70 bcy	11.20 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	2.34 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	2.34 ecy	6.26 /ecy
	Backfill, light soil, by hand, no compaction	1.24 lcy	36.85 /lcy
	Backfill and compact, by hand, 12" layers, compaction in layers, vibrating plate, add to above	1.24 ecy	6.41 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	2.47 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	3.70 unit	63.44 /unit
	31530 Sanitary Sewer Piping		
Public Sanitary Utility Sewerage Piping, piping polyvinyl chloride pipe, B & S, 13' lengths, 8" diameter, SDR 35, excludes excavation or backfill	100.00 lf	14.73 /lf	
Sanitary Sewer Piping	100.00 lf	14.73 /lf	
	100.00 LF	17.08 /LF	
12Di150	12" DIP Water Class 50		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	46.30 bcy	7.15 /bcy
Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	8.67 lcy	39.10 /lcy	

Area	Assembly Description	Takeoff Quantity	Total Cost/Unit
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	8.67 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.69 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	34.72 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	11.57 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	46.30 cy	22.75 /cy
	31510 Water Distribution (Domestic or Fire)		
	Water supply distribution piping, ductile iron, cement lined, tyton push-on joint, fittings, 18' lengths, 12" diameter, class 50, excludes excavation backfill	100.00 lf	71.34 /lf
	Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 12" diameter, class 50 water piping	1.00 ea	3,133.92 /ea
	Water Distribution (Domestic or Fire)	100.00 lf	102.68 /lf
	12Di150 12" DIP Water Class 50	100.00 LF	113.22 /LF
12Pv100	12" PVC Sanitary SDR35		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	46.30 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	8.67 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	8.67 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.68 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	34.72 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	11.57 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	46.30 cy	22.76 /cy
	31530 Sanitary Sewer Piping		
	Public Sanitary Utility Sewerage Piping, piping polyvinyl chloride pipe, B & S, 13' lengths, 12" diameter, SDR 35, excludes excavation or backfill	100.00 lf	24.48 /lf
	Sanitary Sewer Piping	100.00 lf	24.48 /lf
	12Pv100 12" PVC Sanitary SDR35	100.00 LF	35.02 /LF
12Pv150	12" PVC Water Class 150		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	46.30 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	8.67 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	8.67 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.68 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	34.72 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	11.57 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	46.30 cy	22.75 /cy
	31510 Water Distribution (Domestic or Fire)		
	Water supply distribution piping, piping polyvinyl chloride, pressure pipe, 12", AWWA C900, Class 150, SDR 18, excludes excavation or backfill	100.00 lf	40.43 /lf
	Water supply distribution piping, fitting, wye or tee, ductile iron, cement lined, mechanical joint, 12" diameter, class 50 water piping	1.00 ea	3,133.92 /ea
	Water Distribution (Domestic or Fire)	100.00 lf	71.77 /lf
	12Pv150 12" PVC Water Class 150	100.00 LF	82.30 /LF
18CI3	18CI3		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	55.56 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	12.90 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	12.90 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.68 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	36.11 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	19.44 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	55.56 cy	25.68 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 18" diameter, 6' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	53.64 /lf
	Storm Drainage Piping	100.00 lf	53.64 /lf
	18CI3 18CI3	100.00 LF	67.90 /LF
18CI5	18CI5		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	55.56 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	12.90 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	12.90 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.66 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	36.11 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	19.44 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	55.56 cy	25.67 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 18" diameter, class 5, excludes excavation or backfill, gaskets	100.00 lf	51.76 /lf
	Storm Drainage Piping	100.00 lf	51.76 /lf
	18CI5 18CI5	100.00 LF	66.03 /LF
24CI3	24CI3		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	92.59 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	34.66 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	34.66 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 clf	6.69 /clf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	46.30 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	46.30 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	92.59 cy	33.43 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 24" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	73.06 /lf
	Storm Drainage Piping	100.00 lf	73.06 /lf
	24CI3 24CI3	100.00 LF	104.01 /LF
24CI5	24CI5		

Area	Assembly Description	Takeoff Quantity	Total Cost/Unit
30CI3	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	92.59 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	34.66 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	34.66 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.68 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	46.30 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	46.30 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	92.59 cy	33.43 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 24" diameter, class 5, excludes excavation or backfill, gaskets	100.00 lf	74.03 /lf
Storm Drainage Piping	100.00 lf	74.03 /lf	
24CI5 24CI5	100.00 LF	104.98 /LF	
30CI3			
30CI5	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	92.59 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	37.38 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	37.38 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	37.04 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	55.56 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	92.59 cy	35.66 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 30" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	120.35 /lf
Storm Drainage Piping	100.00 lf	120.35 /lf	
30CI3 30CI3	100.00 LF	153.37 /LF	
30CI5			
36CI3	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	92.59 bcy	7.15 /bcy
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	37.38 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	37.38 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	37.04 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	55.56 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	92.59 cy	35.66 /cy
	33630 Storm Drainage Piping		
	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 30" diameter, class 5, excludes excavation or backfill, gaskets	100.00 lf	153.18 /lf
Storm Drainage Piping	100.00 lf	153.18 /lf	
30CI5 30CI5	100.00 LF	186.20 /LF	
36CI3			
36CI5	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	122.22 bcy	7.15 /bcy
	Trench box and jacks, cost per sfca trench wall, monthly rental	1,100.00 sf	0.34 /sf
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	51.60 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	51.60 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	44.44 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	77.78 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	100.00 cy	48.75 /cy
	33630 Storm Drainage Piping		
Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 36" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	152.49 /lf	
Storm Drainage Piping	100.00 lf	152.49 /lf	
36CI3 36CI3	100.00 LF	201.24 /LF	
36CI5			
42CI3	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 4' to 6' deep, excavator, excludes sheeting or dewatering	122.22 bcy	7.15 /bcy
	Trench box and jacks, cost per sfca trench wall, monthly rental	1,100.00 sf	0.34 /sf
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	51.60 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	51.60 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.68 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	44.44 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	77.78 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	100.00 cy	48.75 /cy
	33630 Storm Drainage Piping		
Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 36" diameter, class 5, excludes excavation or backfill, gaskets	100.00 lf	203.79 /lf	
Storm Drainage Piping	100.00 lf	203.79 /lf	
36CI5 36CI5	100.00 LF	252.54 /LF	
42CI3			
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	155.56 bcy	5.78 /bcy
	Trench box and jacks, cost per sfca trench wall, monthly rental	1,200.00 sf	0.34 /sf
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	72.39 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	72.39 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf
	Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	47.53 ecy	4.71 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	108.03 lcy	13.74 /lcy
	Trench for Utilities (Uniform Depth Only)	155.56 cy	40.55 /cy
	33630 Storm Drainage Piping		

Area	Assembly Description	Takeoff Quantity	Total Cost/Unit
42C15	Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 42" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	183.77 /lf
	Storm Drainage Piping	100.00 lf	183.77 /lf
	42C13 42C13	100.00 LF	246.84 /LF
	42C15		
	31500 Trench for Utilities (Uniform Depth Only)		
	Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	155.56 bcy	5.78 /bcy
	Trench box and jacks, cost per sfca trench wall, monthly rental	1,200.00 sf	0.34 /sf
	Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	-18.35 lcy	39.10 /lcy
	Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	-18.35 ecy	6.26 /ecy
	Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.66 /ctf
Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	138.27 ecy	4.71 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	17.28 lcy	13.74 /lcy	
Trench for Utilities (Uniform Depth Only)	155.56 cy	8.82 /cy	
33630 Storm Drainage Piping			
Water supply distribution piping, concrete cylinder pipe (CCP), 150 PSI, 32' L, 42" diameter, excludes excavation or backfill, and gaskets	100.00 lf	317.81 /lf	
Storm Drainage Piping	100.00 lf	317.81 /lf	
42C15 42C15	100.00 LF	331.53 /LF	
54C13			
31500 Trench for Utilities (Uniform Depth Only)			
Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	216.67 bcy	5.78 /bcy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	1,300.00 sf	0.34 /sf	
Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	107.76 lcy	39.10 /lcy	
Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	107.76 ecy	6.26 /ecy	
Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf	
Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	50.00 ecy	4.71 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	166.67 lcy	13.74 /lcy	
Trench for Utilities (Uniform Depth Only)	216.67 cy	42.08 /cy	
33630 Storm Drainage Piping			
Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 54" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	233.68 /lf	
Storm Drainage Piping	100.00 lf	233.68 /lf	
54C13 54C13	100.00 LF	324.84 /LF	
54C15			
31500 Trench for Utilities (Uniform Depth Only)			
Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	216.67 bcy	5.78 /bcy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	1,300.00 sf	0.34 /sf	
Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	107.76 lcy	39.10 /lcy	
Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	107.76 ecy	6.26 /ecy	
Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.66 /ctf	
Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	50.00 ecy	4.71 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	166.67 lcy	13.74 /lcy	
Trench for Utilities (Uniform Depth Only)	216.67 cy	42.08 /cy	
33630 Storm Drainage Piping			
Water supply distribution piping, concrete cylinder pipe (CCP), 150 PSI, 32' L, 54" diameter, excludes excavation or backfill, and gaskets	100.00 lf	384.50 /lf	
Storm Drainage Piping	100.00 lf	384.50 /lf	
54C15 54C15	100.00 LF	475.66 /LF	
60C13			
31500 Trench for Utilities (Uniform Depth Only)			
Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	259.26 bcy	5.78 /bcy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	1,400.00 sf	0.34 /sf	
Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	130.98 lcy	39.10 /lcy	
Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	130.98 ecy	6.26 /ecy	
Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.67 /ctf	
Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	55.56 ecy	4.71 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	203.70 lcy	13.74 /lcy	
Trench for Utilities (Uniform Depth Only)	259.26 cy	42.37 /cy	
33630 Storm Drainage Piping			
Public Storm Utility Drainage Piping, reinforced concrete pipe (RCP), 60" diameter, 8' lengths, class 3, excludes excavation or backfill, gaskets	100.00 lf	294.46 /lf	
Storm Drainage Piping	100.00 lf	294.46 /lf	
60C13 60C13	100.00 LF	404.31 /LF	
60C15			
31500 Trench for Utilities (Uniform Depth Only)			
Excavating, trench or continuous footing, common earth, 1 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering	259.26 bcy	5.78 /bcy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	1,400.00 sf	0.34 /sf	
Fill by borrow and utility bedding, for pipe and conduit, sand, dead or bank, excludes compaction	130.98 lcy	39.10 /lcy	
Fill by borrow and utility bedding, for pipe and conduit, compacting bedding in trench	130.98 ecy	6.26 /ecy	
Utility Line Signs, Markers, and Flags, underground tape, detectable, reinforced, aluminum foil core, 2", excludes excavation and backfill	1.00 ctf	6.69 /ctf	
Backfill, trench, 6" to 12" lifts, dozer backfilling, compaction with vibrating roller	55.56 ecy	4.71 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	203.70 lcy	13.74 /lcy	
Trench for Utilities (Uniform Depth Only)	259.26 cy	42.37 /cy	
33630 Storm Drainage Piping			
Water supply distribution piping, prestressed concrete cylinder pipe (pccp), 150 psi, 24' l, 60" diameter, excludes excavation backfill, and gaskets	100.00 lf	527.77 /lf	
Storm Drainage Piping	100.00 lf	527.77 /lf	
60C15 60C15	100.00 LF	637.62 /LF	
InletNR			
Non Rated Inlet			
33635 Manholes & Catch Basins			
Storm Drainage Manholes, Frames, and Covers, concrete, precast, 4' I.D., 8' deep, excludes footing, excavation, backfill, frame and cover	1.00 ea	2,729.06 /ea	
Storm Drainage Manholes, Frames, and Covers, precast concrete, 4' diameter manhole, 8" thick top	1.00 ea	608.00 /ea	

Area	Assembly Description	Takeoff Quantity	Total Cost/Unit
Inlet_R	Curb inlet frame, grate and curb box, large 24"x36", hvy duty	1.00 ea	1,450.00 /ea
	Storm Drainage Manholes, Frames, and Covers, steps, standard sizes, galvanized steel	7.00 ea	48.81 /ea
	Base slab; form, resteel and concrete to 8" thick, avg cost per CY	0.74 cy	498.97 /cy
	Excavate pit, common earth, hyd backhoe, 3/4 CY bucket	12.00 cy	23.84 /cy
	Trench box and jacks, cost per sfca trench wall, based on monthly rental	216.00 sf	0.34 /sf
	Backfill, trench, air tamped compaction, add	4.67 ecy	19.44 /ecy
	Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	7.33 lcy	13.74 /lcy
	Manholes & Catch Basins	1.00 ea	6,049.39 /ea
	InletNR Non Rated Inlet	1.00 EA	6,049.39 /EA
	Rated Inlet		
	33635 Manholes & Catch Basins		
	Rated Storm Drainage Manholes, Frames, and Covers, concrete, precast, 4' I.D., 8' deep, excludes footing, excavation, backfill, frame and cover	1.00 ea	8,207.91 /ea
	Storm Drainage Manholes, Frames, and Covers, precast concrete, 4' diameter manhole, 24" thick top	1.00 ea	2,052.01 /ea
	Curb inlet frame, grate and curb box, large 24"x36", hvy duty	1.00 ea	6,155.99 /ea
	Storm Drainage Manholes, Frames, and Covers, steps, standard sizes, galvanized steel	7.00 ea	48.82 /ea
Base slab; form, resteel and concrete to 24" thick, avg cost per CY	2.50 cy	498.99 /cy	
Excavate pit, common earth, hyd backhoe, 3/4 CY bucket	12.00 cy	23.84 /cy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	216.00 sf	0.34 /sf	
Backfill, trench, air tamped compaction, add	4.67 ecy	19.44 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	7.33 lcy	13.74 /lcy	
Manholes & Catch Basins	1.00 ea	18,556.47 /ea	
Inlet_R Rated Inlet	1.00 EA	18,556.47 /EA	
Non Rated Manhole			
33635 Manholes & Catch Basins			
Storm Drainage Manholes, Frames, and Covers, concrete, precast, 5' I.D., 8' deep, excludes footing, excavation, backfill, frame and cover	1.00 ea	4,559.95 /ea	
Storm Drainage Manholes, Frames, and Covers, precast concrete, 5' diameter manhole, 8" thick top	1.00 ea	843.61 /ea	
Utility area drains, catch basins manhls catch basins manhls frames and covers, cast iron, heavy traffc, 36"dm, 1150lb, excluds footing, excavtn, and backfill	1.00 ea	1,749.89 /ea	
Storm Drainage Manholes, Frames, and Covers, steps, standard sizes, galvanized steel	7.00 ea	48.82 /ea	
Base slab; form, resteel and concrete to 8" thick, avg cost per CY	0.74 cy	498.97 /cy	
Excavate pit, common earth, hyd backhoe, 3/4 CY bucket	12.00 cy	23.84 /cy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	216.00 sf	0.34 /sf	
Backfill, trench, air tamped compaction, add	1.97 ecy	19.43 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	10.04 lcy	13.74 /lcy	
Manholes & Catch Basins	1.00 ea	8,400.35 /ea	
MH_NR Non Rated Manhole	1.00 EA	8,400.35 /EA	
Rated Manhole			
33635 Manholes & Catch Basins			
Rated Storm Drainage Manholes, Frames, and Covers, concrete, precast, 5' I.D., 8' deep, excludes footing, excavation, backfill, frame and cover	1.00 ea	12,311.95 /ea	
Storm Drainage Manholes, Frames, and Covers, precast concrete, 5' diameter manhole, 24" thick top	1.00 ea	2,735.96 /ea	
Aircraft Rated covers, cast iron, heavy traffc, 36"dm, excluds footing, excavtn, and backfill	1.00 ea	6,840.01 /ea	
Storm Drainage Manholes, Frames, and Covers, steps, standard sizes, galvanized steel	7.00 ea	48.81 /ea	
Base slab; form, resteel and concrete to 24" thick, avg cost per CY	2.50 cy	498.99 /cy	
Excavate pit, common earth, hyd backhoe, 3/4 CY bucket	12.00 cy	23.84 /cy	
Trench box and jacks, cost per sfca trench wall, based on monthly rental	216.00 sf	0.34 /sf	
Backfill, trench, air tamped compaction, add	1.97 ecy	19.44 /ecy	
Hauling, excavated or borrow material, loose cubic yards, 3 mile round trip, 2.1 loads/hour, 6 C.Y. dump truck, highway haulers, excludes loading	10.04 lcy	13.74 /lcy	
Manholes & Catch Basins	1.00 ea	24,013.04 /ea	
MH_R Rated Manhole	1.00 EA	24,013.04 /EA	