



Production Rates Guidelines for Arizona Highway Construction

Last Revised: October 2018

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES

BACKGROUND INFORMATION AND DISCLAIMER

Average production rates for common construction activities are provided in this document. This list is not intended to be all-inclusive nor is it intended to capture all contingencies encountered in the field. A few examples have been provided below for consideration:

- Project specific field conditions can have major impacts on production rates. Narrow, sinuous, mountainous roads will have a lower production rate for placement of pavement than straight, flat multi-lane sections of highway.
- Seasonal variations in traffic (e.g., higher winter tourist season volumes than summer), holiday weekends, weather conditions and associated construction windows, coordination with other projects, environmentally sensitive time windows (e.g., breeding seasons), and other project specific considerations can all potentially impact production rates.
- Distant material source locations can greatly increase haul times and reduce placement rates.
- Required minimum wait times for construction activities, like seeding establishment and final pavement markings, impact the project duration so need to be considered indirectly for production rates.

Due to reasoning listed above and many others not outlined herein, it must be stated that the following list is provided by the Department solely for informational purposes. Considerable engineering judgement must be exercised in its application. It is also highly recommended that designers communicate with District personnel for project-specific rates that can realistically be achieved during construction.

Every attempt has been made to provide reasonable production rates for the elements of work shown herein; however, there may be individual rates that need refinement due to updated technology, methodology, etc. If users of this document notice rates that require modification, information can be conveyed to the Department via email (MLB_PRO_RATES@azdot.gov) and the feedback will be evaluated.

**ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 200 (GRADING/REMOVALS)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
2010001	Clearing & Grubbing	Acre		0.5	1.0	1.0	
2010020	Removal of Trees	Each	10 - 15				Production Rate shown is based on removal of 3" to 6" diameter trees. Trees greater than 12" diameter reduce rate to around 3 per day.
2020009	Removal Of Structural Concrete	Cu.Yd.	20				
2020019	Removal of Embankment Curb	L.Ft.	2,000				
2020021	Remove Curb & Gutter	L.Ft.	800				
2020025	Removal of Sidewalks, Driveways And Slabs	Sq.Yd.	500 - 1,000				
2020029	Removal Of Asphaltic Concrete Pavement	Sq.Yd.	1,000				
2020030	Milling (1-lane width, 1" depth)	Sq.Yd.	24,000				
2020030	Milling (1-lane width, 2" depth)	Sq.Yd.	20,000				
2020030	Milling (1-lane width, 3" depth)	Sq.Yd.	16,000				
2020030	Milling (1-lane width, 4" depth)	Sq.Yd.	12,000				
2020031	Removal Of Portland Cement Concrete Pavement	Sq.Yd.	300 - 500				Production rate based on assumption of 8" removal depth.
2020053	Remove Spillway (Including Inlet & Outlet)	Each	2 - 4				
2020071	Remove Guardrail	L.Ft.	750 - 1,000				
2020101	Remove Fence (Hand Removal)	L.Ft.	2,500				
2020101	Remove Fence (Mechanical Removal)	L.Ft.	10,000				
2020120	Remove (Metal Handrail)	L.Ft.	50				
	Remove (Temporary Concrete Barrier)	L.Ft.	1,000 - 1,500				
	Remove (Temporary Preformed Tape)	L.Ft.	8 miles				

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BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
2020201	Sawcutting (AC)	L.Ft.	500				
2020201	Sawcutting (PCCP)	L.Ft.	350				
203011X	Shoulder Buildup (Earthen or Milled AC) (Including Compaction)	L.Ft.	8,800				Production rate used is governed by placement, i.e., it is assumed that haul-in does not limit placement rate.
2030201	Excavation - Granular (Truck)	Cu.Yd.	3,000 - 3,500				
2030201	Excavation - Granular (Scraper)	Cu.Yd.	6,000 - 7,000				
2030201	Excavation - Reconstruction	Cu.Yd.	2,500				
2030201	Excavation - Subgrade (New Construction)	Cu.Yd.	2,000 - 3,000				Based on a rate of 250 to 350 Cu.Yd. per hour. Projects with unfettered access (e.g. no MOT issues limiting movement or roadway closed) could see up to 550 to 750 Cu.Yd per hour.
2030201	Excavation - Subgrade (Reconstruction)	Cu.Yd.	2,000 - 3,000				
2030201	Excavation - Rock (Blasting)	Cu.Yd.	1,500				
2050001	Grade Roadway For Pavement	Sq.Yd.	3,000 - 4,000				

**ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 300 (BASES)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
3020001	Cement Treated Subgrade	Sq.Yd.		4,000	9,000 - 10,000		Usually lime treated.
3030022	Aggregate Base, Class 2	Cu.Yd.		250 - 750	750 - 1,200	1,500 - 2,000	Production rate used is governed by placement, i.e., it is assumed that haul-in does not limit placement rate.
3040001	Cement Treated Base (CTB)	Ton		850	1,900	2,200	

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES

SPECIFICATIONS SECTION 400 (SURFACE TREATMENTS PAVEMENTS)

Note that paving production rates typically do not include time for plant setup, commercial sourcing, and mix design approval. Also, paving generally cannot begin on the first day of construction due to setup of above. Additionally, once the distance from the project approaches 30 miles and/or individual phases of paving exceeds 25,000 tons, the contractor may evaluate feasibility of setting up a batch plant. Batch plant production can be in the range of 350 to 400 tons per hour so batch plants generally never govern AC placement.

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
4010010	Portland Cement Concrete Pavement (10")	Sq.Yd.	1,000 - 3,000				Non-slip form
4010012	Portland Cement Concrete Pavement (12")	Sq.Yd.		5,000	7,000	9,000	Non-slip form
4010012	Portland Cement Concrete Pavement	Sq.Yd.	3,000 - 4,000				At ramp and taper locations.
4010040	Continuously Reinforced PCCP (Limited Areas)	Sq.Yd.	1,000 - 3,000				
4020048	Grind Existing Portland Cement Concrete Pavement	Sq.Yd.	5,000				Example would be grinding a lane of travel (not a spot repair).
4020072	Repair Portland Cement Concrete Pavement (Spalled Areas)	Sq.Ft.	400 - 500				
4020050	Reconstruct Concrete Pavement Joint	L.Ft.	1,000				
4040101	Prime Coat	Ton		8 - 10	10 - 20		
4040156	Slurry Seal	Sq.Yd.		16,000	40,000	100,000	
4040162	Cover Material	Cu. Yd.	800				
4070001	ACFC (Including Tack)	Ton		500	1,000		
4080001	Recycled Asphaltic Concrete (Including Tack)	Ton		400	1,500	3,000	
4080003	Hot In-Place Recycled Asphaltic Concrete (Sq.Yd.	5,000				One lane-mile/day
4080011	Cold Recycling (Bituminous Surface)	Sq.Yd.		3,900	8,000	14,000	
4090003	Asphaltic Concrete (Miscellaneous Structural)	Ton		500 - 1,000	2,000 - 2,500	2,700 - 3,000	
4160008	AC (Including Tack)	Ton		1,000 - 1,500	1,800 - 2,300	2,500 - 3500	Production rate could be bumped down to 800 to 1,200 tons per day for non-linear paving (e.g., paving of many radii/turnouts).

**ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 500 (DRAINAGE)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)	
	Storm Drain Trunk	L.Ft.	200 - 300	
5012524	Storm Sewer, Less Than 30"	L.Ft.	200 - 300	
5012530	Storm Sewer, 30" and Greater	L.Ft.	100 - 150	
50110XX	Pre-Cast Concrete Pipes 18" - 36"	L.Ft.	150 - 250	<p>Production rates are for the placement of pipe. Include 1 working day of lead time (for pipe excavation) and 2 working days lag time (for pipe backfill) for each run of pipe.</p> <p>For pre-cast concrete pipes, the high end of production can be used for long urban installations.</p>
50110XX	Pre-Cast Concrete Pipes 42" and Above	L.Ft.	80 - 100	
50110XX	Cast-In-Place Concrete Pipes 18" - 36"	L.Ft.	150 - 200	
50110XX	Cast-In-Place Concrete Pipes 42" and Above	L.Ft.	80-100	
50110XX	Corrugated Metal Pipes 18" - 36"	L.Ft.	200	
50110XX	Corrugated Metal Pipes 42" and Above	L.Ft.	100	
50110XX	Plastic Pipes 18" - 36"	L.Ft.	200	
5020120	Structural Plate	L.Ft.	10 - 15	
5030236	Catch Basin (8' single catch basin. Adjust accordingly for larger, double catch basins)	Each	1	Production rate is for installing forms and pouring concrete. Include 1 working day of lead time (for excavation) and 2 working days of lag time (to strip forms and backfill) for the phase in which catch basin(s) is/are being installed.
5030500	Junction Box	Each	7 Calendar Days	
5050021	Manholes	Each	1 - 2	Installation of a single manhole takes 2 days. When installing 6 or more, installation rate averages out to about 2 per day.
5050201	Adjust Manhole Frames	Each	5	
5060190	Wells	Each	100 Calendar Days	

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES SPECIFICATIONS SECTION 600 (STRUCTURES)

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT				NOTES
			PRODUCTIVITY RATES (WORKING DAY UNLESS OTHERWISE NOTED)				
NEW CONSTRUCTION - FOUNDATION							
	Spread Footings	Each	10 - 15 days				
	Driven Piles	L.Ft.	200				
	Drilled Shafts		WET EXCAVATION	DRY EXCAVATION			
	24"-60" Diameter	L.Ft.	40	80			
	66"-96" Diameter	L.Ft.	30	60			
	100"+ Diameter	L.Ft.	20	40			
	Rock Socket	L.Ft.	10	20			
NEW CONSTRUCTION - SUB STRUCTURE							
	Abutment Caps	Each	10 days				
	Pier Caps	Each	10 days				
	Columns	Each	10 days				Production rate is based on 10 ft to 30 ft column.
	Abutment Wall/Pier Wall	Each	5 - 10 days				
	Foundation Transition Caps	Each	10 - 15 days				
NEW CONSTRUCTION - SUPER STRUCTURE CONCRETE			1-SPAN	2-SPAN	3-SPAN	4-SPAN +	
	Precast Prestressing Girders	Each	20 days	30 days	40 days	50 days	
	Cast-in-Place Prestressing Box and T-Beam	Each	30 days	40 days	50 days	60 days	
	Cast-in-Place Reinforced Box and T-Beam	Each	40 days	50 days	60 days	70 days	
	Cast-in-Place Solid/Void slab	Each	30 days	40 days	50 days	60 days	
NEW CONSTRUCTION - SUPER STRUCTURE STEEL			1-SPAN	2-SPAN	3-SPAN	4-SPAN +	
	I-Section (Roll and Composite)	Each	20 days	30 days	40 days	50 days	
	Box Section	Each	30 days	40 days	50 days	60 days	
	Truss	Each	35 days	45 days	55 days	55 days	
	Cable Stayed	Each	60 days	80 days	100 days	120 days	
	Cable Suspension	Each	90 days	110 days	130 days	150 days	

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES SPECIFICATIONS SECTION 600 (STRUCTURES)

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT				NOTES
			PRODUCTIVITY RATES (WORKING DAY UNLESS OTHERWISE NOTED)				
BRIDGE REHABILITATION		<i>Assuming no restrictions. For phase construction need to calculate production rate per phase.</i>					
	Deck Replacement	Each	20 - 40 days				If additional protection is required (e.g., box girder) then rate is closer to 40 - 50 days.
	Scour Retrofit	Each	20 days				
	Deck Repair/Partial Depth Patch	Each	5 days				
	Bridge Deck Overlay Deep (Microsilica)	Each	20 - 30 days				Include removal
	Bridge Deck Overlay Thin (Multi-Layer Epoxy/Polyester)	Each	10 days				Include removal
	Bridge Deck Crack Seal (Single Layer Epoxy/Methacrylate)	Each	5 days				No removal
	Bridge Joint Replacement	Each	3 days				
	Barrier Replacement	Each	15 days				Rate accounts for required cure time before barrier can be exposed to traffic.
	Bridge Painting	Each	5 days				
	Super Structure Replacement	<i>See "New Construction - Super Structure" and add 5 days per span for demolition.</i>					
BOX CULVERT							
	Precast	L.Ft.	20 - 30				Minimum 5 days
	Cast-in-Place		1-BARREL	2-BARREL	3-BARREL	4-BARREL+	
	Height 3'-5'	Each	15 days	20 days	25 days	30 days	
	Height 6'-10'	Each	20 days	25 days	30 days	35 days	
	Height 10'+	Each	25 days	30 days	35 days	40 days	
	Headwalls	Each	1 day				

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 700 (TRAFFIC)

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
607003X	Foundations - Square Tube	Each	20				Sign can be mounted the following day (half hour per foundation for placement).
607002X	Foundations - W and S Posts	Each	5				Sign can be mounted the following day (two hours per foundation for placement).
60600XX	Foundations - Tubular and Tapered Tube Sign Structures	Each	2				Each foundation requires half a day for placement and another 7 calendar days for cure time before panels can be mounted.
607XXXX	Posts - Square Tube	Each	30				Two posts require approximately 20 minutes to install.
607005X	Posts - W and S Beam	Each	10				Two posts require approximately 1 hour to install.
60601XX	Posts - Tubular and Tapered Tube Sign Structures	Each	1 - 2				Lead time for structure is approximately 40 calendar days.
60800XX	Sign Panels - Non Extruded	Each	20				
6080018	Sign Panels - Extruded	Each	10				
60800XX	Sign Panels - Tubular and Tapered Tube Sign Structures	Each	4				Structure must be inspected by Bridge before signs can be mounted.
7010XXX	Initial Advance Warning Setup		1 - 2 Working Days				
7010010	Temporary Concrete Barrier	L.Ft.		800 - 1,000	1,500 - 2,500	1,500 - 2,500	Production rate of 200 L.Ft. per hour applicable for longer runs, defined as when TCB placement exceeds 1 mile. On complete highway closures with full access, rates could be as high to 6,000 to 8,000 L.Ft. per day.
7015052	Obliterate Pavement Marking (Stripe)	L.FT.	2,000 - 3,000				
7040003	Thermoplastic Pavement Marking	L.Ft.			30,000	60,000	Assumes 6" wide stripe. Also, there is a mandatory 30 to 60 calendar day wait time after placement of initial striping to place final striping.
704007X	Thermoplastic Pavement Symbol/Legend	Each	30				
7042037	Primer Sealer For PCCP	L.Ft.	800				
7042051	Removal Of Curing Compound for PCCP	L.Ft.	800				
70500XX	Pavement Marking, Preformed	L.Ft.	18,000				

ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES

SPECIFICATIONS SECTION 700 (TRAFFIC)

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
7060XX	Pavement Marker (Retroreflective)	Each			500	1,000	
70800XX	Permanent Pavement Marking (Painted)	L.Ft.			35,000	70,000	Assumes 4" wide stripe.
709000X	Dual Component Pavement Marking (Epoxy)	L.Ft.			2,500	5,000	Assumes 6" wide stripe. Also, there is a mandatory 30 to 60 calendar day wait time after placement of initial striping to place final striping.
709001X	Dual Component Pavement Symbol/Legend	Each	8				
7310XX	Foundation for Signal Pole	Each	2				Each foundation requires half a day for placement and another 7 calendar days for cure time before pole can be mounted.
7310010	Traffic Signal Posts	Each	2				Lead time for non-Department furnished poles is approximately 120 to 170 calendar days.
73204XX	Pull Box	Each	10				
7320XX	Conductors	L.Ft.	400				
7330010	Traffic Signal Face	Each	10				
7340XX	Control Cabinet	Each	3 Working Days				Lead time for cabinets is approximately 110 to 140 calendar days.
7340120	Meter Pedestal Cabinet	Each	4 Working Days				
7350010	Counter Loop Detectors (Loop Replacement 1 Direction)	Each	2 - 4				
7350010	Counter Loop Detectors (Loop Replacement Both Directions)	Each	1				
7350010	Counter Loop Detector (New System)	Each	3 Working Days				
73502XX	Video Detection System (Signal)	Each	2				
7360104	Lighting (Luminaire)	Each	3 Working Days				
736016X	Uninterruptible Power Supply (UPS) Cabinet	Each	3 Working Days				
73707XX	Conduit Placement (Trench)	L.Ft.	750 - 1,000				
73707XX	Conduit Placement (Bore)	L.Ft.	500				
9280036	Ground-In Rumble Strip (8 Inch)	L.Ft.	30,000				
	Activity Allowance (Transition Between Project Activities)	Each	1 - 3 Working Days				Switch time is dependent on complexity of work and Maintenance of Traffic setup and total time allowed is dependent on number of project activities.

**ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 800 (ROADSIDE DEVELOPMENT)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
8030100	Decomposed Granite	Sq.Yd.	500				
8040001	Top Soil (New)	Cu.Yd.		350	350	175	
8050003	Seeding (1 Acre or Less)	Acre	1				Requires a 45 calendar day establishment period.
8050003	Seeding (Projects Greater Than 1 Acre)	Acres	5 - 10				Seeding requires a 45 calendar day establishment period after placement. For BLM and Forest projects, seed mix must be approved prior to placement.
8061005	Trees (15 Gallon)	Each	13 - 25				
8061009	Trees (24" Box)	Each	3 - 7				
8061011	Trees (36" Box)	Each	2 - 5				
8061296	Shrubs	Each	40 - 60				
8061611	Cactus	Each	13 - 25				
8061630	Saguaro (6' - 12')	Each	4				
8063002	Salvage Tree / Cactus Nursery	Each	3				
8080645	Reset Water Meter Box	Each	7				
8080664	Pump House	Each	100 Calendar Days				
810102X	Erosion Control (Wattles)	L.Ft.		500	1,000	1,000	
9240129	Control of Noxious Plants - Herbicide	Sq.Yd.	25,000				
9240139	Control of Noxious Plants - Manual Methods	Sq.Yd.	4,000				

**ARIZONA DEPARTMENT OF TRANSPORTATION - TYPICAL PRODUCTION RATES
SPECIFICATIONS SECTION 900 (INCIDENTALS)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
9020001	Fence (Chain Link)	L.Ft.	1,200				
90300XX	Fence (Wire)	L.Ft.	1,500 - 3,000				Rate of placement is highly dependent upon terrain.
9050001	Guardrail	L.Ft.	300 - 400				Time for installation of end anchor (if needed) does not substantially change rates shown. Shop curved guardrail installation rate is appreciably less than rates shown.
9050026	Guardrail Terminal (Tangent Type)	Each	2 - 3				
9050430	Bridge to Barrier Transition	Each	1				Does not include time to install Bridge Barrier Transition.
9060021	Cattleguard	Each	5 Working Days				
9080084	Curb & Gutter	L.Ft.	300 - 1,500				Lower end of range accounts for manual form work whereas higher end of range is handled via slip form.
9080131	Valley Gutter	L.Ft.	100				
9080140	Concrete Gutter	L.Ft.	500				
9080201	Concrete Sidewalk	Sq.Ft.	500 - 600				
9080303	Concrete Driveway	Sq.Ft.	100 - 300				Installation of a single driveway (roughly 200 Sq.Ft.) takes 2 days. When installing multiple driveways, installation rate averages out to about 2 driveways per day.
9090001	Mobilization	L.Sum	10 - 30 Working Days				Mobilization time also accounts for required Construction Survey and Layout, which can vary depending on project complexity.
9100001	Roadway Barrier (Including Footing)	L.Ft.	100 - 200				Includes 3 days place/cure for barrier footing. Does not include required cure time before barrier can be exposed to traffic.
9110001	Right-of-Way Markers	Each	30				

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SPECIFICATIONS SECTION 900 (INCIDENTALS)**

BID ITEM NUMBER	DESCRIPTION	UNIT	CLASSIFICATION INDEPENDENT	URBAN	RURAL	INTERSTATE	NOTES
			PRODUCTIVITY RATES (PER WORKING DAY UNLESS OTHERWISE NOTED)				
9110001	Right-of-Way & Survey Markers	Each	20				
9130001	Riprap	Cu.Yd.	100				Approximately 2 locations per day.
9130001	Bank Protection (Riprap)	Cu.Yd.	75				
9140003	Ramada	Each	10 - 15 Working Days				
9140006	Rest Area Structure	Each	180 to 360 Calendar Days				Rate is highly variable as it is based on amenities of facility.
91401XX	Retaining Walls	Sq.Ft.	100 - 150				Production rate is for MSE or CIP wall in the range of 8 ft to 12 ft height. Taller walls could substantially reduce placement rate.
914013X	Noise Barrier Wall	Sq.Ft.	300 - 400				
9160001	Embankment Curb	L.Ft.	200 - 400				In situations where curb is a long continuous run, rates up to 800 to 1,200 L.Ft. per day can be realized.
9170003	Embankment Spillway	L.Ft.	30 - 50				
9170037	Inlets	Each	2 - 3				
9170151	Energy Dissipaters	Each	7 Working Days				Production rate assumes new installation of dissipater. Installation of dissipaters to an existing facility can double or more the time required for installation due to tie-ins.
9200001	Paved Ditch	L.Ft.	300				
9201001	Lined Channel	Sq.Yd.	75 - 125				