A. D. 114

INDIANA DEPARTMENT OF TRANSPORTATION

INDIANAPOLIS, INDIANA 46204-2249

INTER-DEPARTMENT COMMUNICATION

December 10, 1997

Memorandum 97-27

MEMORANDUM

TO: District Directors
District Construction Engineers
District Development Engineers
District Traffic Engineers
District Operations Engineers
Area Engineers

FROM: Timothy D. Bertram, Chief
Operations Support Division

RE: Guidelines for Setting Contract Time

Attached herewith are revised charts and specific examples of bridge work to be used as a guide for setting contract time. Setting contract time is not an exact science. Many things must be taken into account when time is set for contract completion.

Outlined below are several steps to be considered when determining time on a contract:

1. A general review of the plans and contract provisions is made to determine type of construction, length of job, number of bridges, traffic features, urban or rural site, magnitude, and any special features of the project.

2. If possible the person setting contract time should visit the site to get a feel for the extent that utilities or other features might impact construction.

3. Determine if a commitment has been made by others to complete the contract, unrestrict lanes, open a road etc., by a certain time.

4. How are schools, businesses, local festivals, farmers, rush hour traffic, other contracts in the area, etc., affected by the contract?

5. Review plans to determine controlling operations.

6. Decide if contract can be completed in one or two construction seasons.

7. Determine how letting date may affect the controlling operations, starting times, completion times, etc.

8. Determine how adjacent contracts, existing or future, any affect detours, restrictions, access on this contract.

9. Using the Itemized Proposal, determine when each item can be done. Certain items control other items while some items can be done simultaneously. Use the controlling items to set the time. Normally the time is set in work days and if a completion date is desired, attached charts will convert work days to calendar days depending on letting dates.

10. Determine in any intermediate times need to be addressed in the contract so that certain roads, bridges, entrances, ramps, etc., are put back into normal use by certain times.

11. Some contracts have items involving specific materials that takes considerable time to obtain. Delivery time for mast arm poles, strain poles, and hi mast poles is about 10 to 12 weeks. Material delivery times should be considered when setting contract time. Delivery time for structural steel is a minimum of three months unless singular members are being used. Singular members delivery time is three weeks. Delivery time for concrete structural members is about six weeks.

12. Because of the construction staffing, certain holidays, or other influencing factors, some contracts can require delayed starting times specified in the contract provisions. Delayed starting times are normally used on resurface or maintenance type contracts but they might be considered for other types of contracts.

13. Permit restrictions can have a major effect on construction schedules. They often control time on bridge contracts. Therefore they should be addressed when time is set for a contract.

14. Once contract time is established an incentive/disincentive clause might be considered. These types of clauses are normally only used on special contracts that involve high traffic volumes. User costs are used to establish time costs and one way to quickly determine a reasonable time cost is to use the following formula:

$$\text{Cost to restrict one lane of traffic during peak lane closure period} = \frac{\text{A.A.D.T.}\ (1 + 2 \times \%\text{Trucks})}{\text{Number of Lanes}}$$

The non-peak lane closure period = 1/3 of peak lane closure period

This formula could also be used as a basis for specifying higher liquidated damages for restriction or closed times/dates.

15. Adjusting the time to fit contract circumstances should always be considered.

16. Last keep your work sheets in a file for future reference.

As stated earlier, setting time is not an exact science. The above information and attached sheets are to serve as a guide only when setting contract time. It should always be kept in mind that because of the tremendous impact construction contracts have on traffic, particularly on high volume roads, the focus of our customer's (the traveling public) satisfaction or dissatisfaction is ever increasing.

A + B contract bidding might be considered for some high profile/traffic jobs such as major interstate reconstruction. B times and B time costs are to be coordinated through Operations Support Division.

Further, if a contract does not sell or many revisions are added, the contract time should be reconsidered to see how the letting date or revision might affect the work.

TDB:pl

WORKDAYS ON CONSTRUCTION CONTRACTS

NOTE: These rates are just a general or average guide to be used when setting time. Large quantity items may increase these rates and small contracts may reduce them. Each project is unique and must be looked at closely prior to setting time.

ITEM DESCRIPTION	UNIT	METRIC UNIT	RATE PER DAY	METRIC UNIT	RATES PER DAY FOR INTERSTATE TYPE CONTRACTS	METRIC UNIT	RATES FOR A+B	METRIC UNIT
Aggregate Shoulder	Tons	Mg	800	725	1600	1450	2000	1825
Bituminous Patching	Tons	Mg	60	55	200	180	300	270
Bituminous Widening	Tons	Mg	900	815	2000	1825	2500	2270
Bituminous Wedge & Level	Tons	Mg	500	455	1000	905	1500	1360
Bituminous Base	Tons	Mg	800	725	2000	1825	3000	2720
Bituminous Binder	Tons	Mg	800	725	2000	1825	3000	2720
Bituminous Surface	Tons	Mg	1000	905	2000	1825	3000	2720
Bituminous Shoulders	Tons	Mg	700	635	1500	1360	2000	1825
Bituminous Approach	Tons	Mg	200	180	500	455	700	635
Catch Basins	Ea	Ea	5	5	10	10	15	15
Chain Link Fence	Lft	m	1200	365	2500	760	3500	1065
Class "A" Concrete in STR's	Cys	m^3	150	115	300	230	400	305
Class "B" Concrete in STR's	Cys	m^3	100	75	200	155	300	230
Combination Curb & Gutter	Lft	m	300	90	600	180	1000	305
Concrete Driveways	Sys	m^3	180	150	400	335	600	500
Concrete Gutter	Lft	m	500	150	1000	305	1500	455
Concrete Patching	Sys	m^2	100	85	200	165	300	250
Concrete Pavement	Sys	m^2	2500	2100	5000	4175	6000	5025

ITEM DESCRIPTION	UNIT	METRIC UNIT	RATE PER DAY	METRIC UNIT	RATES PER DAY FOR INTERSTATE TYPE CONTRACTS	METRIC UNIT	RATES FOR A+B	METRIC UNIT
Concrete Sidewalk	Sys	m^2	1000	1680	1500	2520	2000	3360
Curb & Gutter	Lft	m	300	90	600	180	1000	305
Drilled Holes	Ea	Ea	250	250	500	500	700	700
Embankment	Cys	m^3	2200	1680	5000	3825	8000	6115
Excavation:								
Borrow Large Areas	Cys	m^3	2500	1910	5000	3825	8000	6115
OR Common Small Areas			500	380	1000	765	2000	1530
Channel	Cys	m^3	650	495	1500	1145	2000	1530
Rock	Cys	m^3	1000	765	2000	1530	2500	1910
Unclassified	Cys	m^3	3000	2300	5000	3825	8000	6125
Ground or Crushed Stone	Tons	Mg	800	725	1800	1635	2500	2270
Granular Backfill	Cys	m^3	300	230	500	385	1000	765
Guardrail	Lft	m	400	120	1000	305	1500	455
Inlet	Ea	Ea	5	5	6	6	9	9
Laying Signal Conduit	Lft	m	200	60	500	150	1000	305
Manholes	Ea	Ea	3	3	6	6	9	9
Paved Side Ditch	Lft	m	350	105	1000	305	1200	365
Pipes:								
Culverts	Lft	m	200	60	300	90	400	120
Underdrains	Lft	m	1000	305	2000	610	3000	915
Removal:								
Curb & Gutter	Lft	m	800	245	1500	455	2000	610
Pavement (Conc.)	Sys	m^2	800	675	1500	1250	2000	1675

	UNIT	METRIC UNIT	RATE PER DAY	METRIC UNIT	RATES PER DAY FOR INTERSTATE TYPE CONTRACTS	METRIC UNIT	RATES FOR A+B	METRIC UNIT
Removal (cont.)								
Sidewalk	Sq.Ft.	m^2	1500	140	3000	280	4000	370
Surface(Milling)	Sys	m^2	10,000	8350	20,000	16,725	30,000	25,075
Rip-Rap	Sys	m^2	200	165	400	335	600	500
Seeding	Acres	ha	10	4	15	6	20	8
Sodding	Sys	m^2	900	750	2000	1675	3000	2500
Subbase	Tons	Mg	800	725	1600	1450	2500	2270
Thermoplastic Pavement:								
Markings	Lft	m	6000	1825	12,000	3650	18,000	5475
Underseal	Tons	Mg	40	36	60	55	80	73
Crack & Seating Pvmt.	Sys	M^2	6000	5000	10,000	8350	13,400	6700
Rubblizing Pavement	Sys	M^2	3000	2510	4000	3345	6000	5015
Excavating for Subgrade Treatment	Cys	M^3	1000	765	2000	1530	2500	1910
Peat Excavation	Cys	M^3	800	610	1000	765	1500	1145
Jacked Pipe	Lft	m	50	15	80	25	100	30
Temp. Conc. Barrier	Lft	m	2400	730	3600	1100	6000	1830
Temp. Crossovers	Ea	Ea	1/5	1/5	1/4	1/4	1/3	1/3
Paved Side Ditch	Lft	m	300	90	450	140	600	180
Concrete Median Barrier	Lft	m	800	245	1000	305	1500	455
Soil Stabilization	Cys	M^3	4500	3440	5870	4500	8000	6100
Sidewalk Curb Ramps	Sys	M^2	20	17			40	34

DISTRIBUTION OF WORKING DAYS
BY MONTHS, THRU 100 W.D. YEAR
CUMULATIVE TOTALS PER MONTH.

MEDIUM & HEAVY GRADING

		JAN.											
0	JAN.		FEB.										
0	FEB.			MAR.									
0	MAR				APR.								
4	APR	4	4	4	4	MAY							
13	MAY	17	17	17	17	13	JUN.						
15	JUN	32	32	32	32	28	15	JUL.					
16	JUL	48	48	48	48	44	31	16	AUG.				
17	AUG	65	65	65	65	61	48	33	17	SEPT.			
15	SEP	80	80	80	80	76	63	48	32	15	OCT.		
15	OCT	95	95	95	95	91	78	63	47	30	15	NOV.	
5	NOV	100	100	100	100	96	83	68	52	35	20	5	DE
0	DEC												
0	JAN												
0	FEB												
0	MAR												
4	APR	104	104	104	104	100	87	72	56	39	24	9	
13	MAY	117	117	117	117	113	100	85	69	52	37	22	
15	JUN	132	132	132	132	128	115	100	84	67	52	37	
16	JUL	148	148	148	148	144	131	116	100	83	68	53	
17	AUG	165	165	165	165	161	148	133	117	100	85	70	
15	SEP	180	180	180	180	176	163	148	132	115	100	85	
15	OCT	195	195	195	195	191	178	163	147	130	115	100	
5	NOV	200	200	200	200	196	183	168	152	135	120	105	1
0	DEC												
0	JAN												
0	FEB												
0	MAR												
4	APR	204	204	204	204	200	187	172	156	139	124	109	1
13	MAY	217	217	217	217	213	200	185	169	152	137	122	1
15	JUN	232	232	232	232	228	215	200	184	167	152	137	1
16	JUL	248	248	248	248	244	231	216	200	183	168	153	1
17	AUG	265	265	265	265	261	248	233	217	200	185	170	1
15	SEP	280	280	280	280	276	263	248	232	215	200	185	1
15	OCT	295	295	295	295	291	278	263	247	230	215	200	1
5	NOV	300	300	300	300	296	283	268	252	235	220	205	1
0	DEC												
0	JAN												
0	FEB												
0	MAR												
4	APR	304	304	304	304	300	287	272	256	239	224	209	
13	MAY	317	317	317	317	313	300	285	269	252	237	222	
15	JUN	332	332	332	332	328	315	300	284	267	252	237	
16	JUL	348	348	348	348	344	331	316	300	283	268	253	
17	AUG	365	365	365	365	361	348	333	317	300	285	270	
15	SEP	380	380	380	380	376	363	348	332	315	300	285	
15	OCT	395	395	395	395	391	378	363	347	330	315	300	
5	NOV	400	400	400	400	396	383	368	352	335	320	305	
0	DEC												

DISTRIBUTION OF WORKING DAYS
BY MONTHS, THRU 110 W.D. YEAR
CUMULATIVE TOTALS PER MONTH.

LIGHT GRADING & URBAN

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC
JAN												
FEB												
MAR												
APR	4	4	4	4								
MAY	17	17	17	17	13							
JUN	34	34	34	34	30	17						
JUL	52	52	52	52	48	35	18					
AUG	70	70	70	70	66	53	36	18				
SEP	88	88	88	88	84	71	54	36	18			
OCT	105	105	105	105	101	88	71	53	35	17		
NOV	110	110	110	110	106	93	76	58	40	22	5	
DEC												0
JAN												
FEB												
MAR												
APR	114	114	114	114	110	97	80	62	44	26	9	4
MAY	127	127	127	127	123	110	93	75	57	39	22	17
JUN	144	144	144	144	140	127	110	92	74	56	39	34
JUL	162	162	162	162	158	145	128	110	92	74	57	52
AUG	180	180	180	180	176	163	146	128	110	92	75	70
SEP	198	198	198	198	194	181	164	146	128	110	93	88
OCT	215	215	215	215	211	198	181	163	145	127	110	105
NOV	220	220	220	220	216	203	186	168	150	132	115	110
DEC												
JAN												
FEB												
MAR												
APR	224	224	224	224	220	207	190	172	154	136	119	114
MAY	237	237	237	237	233	220	203	185	167	149	132	127
JUN	254	254	254	254	250	237	220	202	184	166	149	144
JUL	272	272	272	272	268	255	238	220	202	184	167	162
AUG	290	290	290	290	286	273	256	238	220	202	185	180
SEP	308	308	308	308	304	291	274	256	238	220	203	198
OCT	325	325	325	325	321	308	291	273	255	237	220	215
NOV	330	330	330	330	326	313	296	278	260	242	225	220
DEC												
JAN												
FEB												
MAR												
APR	334	334	334	334	330	317	300	282	264	246	229	224
MAY	347	347	347	347	343	330	313	295	277	259	242	237
JUN	364	364	364	364	360	347	330	312	294	276	259	254
JUL	382	382	382	382	378	365	348	330	312	294	277	272
AUG	400	400	400	400	396	383	366	348	330	312	295	290
SEP	418	418	418	418	414	401	384	366	348	330	313	308
OCT	435	435	435	435	431	418	401	383	365	347	330	325
NOV	440	440	440	440	436	423	406	388	370	352	335	330
DEC												

BRIDGE

DISTRIBUTION OF WORKING DAYS
BY MONTHS, THRU 135 W.D. YEAR
CUMULATIVE TOTALS PER MONTH.

		JAN.										
	JAN.	0	FEB.									
	FEB.	0	0	MAR.								
	MAR	0	0	0	APR.							
	APR	14	14	14	14	MAY						
16	MAY	30	30	30	30	16	JUN.					
18	JUN	48	48	48	48	34	18	JUL.				
19	JUL	67	67	67	67	53	37	19	AUG.			
18	AUG	85	85	85	85	71	55	37	18	SEPT.		
18	SEP	103	103	103	103	89	73	55	36	18	OCT.	
17	OCT	120	120	120	120	106	90	72	53	35	17	NOV.
15	NOV	135	135	135	135	121	105	87	68	50	32	15
0	DEC											
0	JAN											
0	FEB											
0	MAR											
14	APR	149	149	149	149	135	119	101	82	64	46	29
16	MAY	165	165	165	165	151	135	117	98	80	62	45
18	JUN	183	183	183	183	169	153	135	116	98	80	63
19	JUL	202	202	202	202	188	172	154	135	117	~~109~~99	82
18	AUG	220	220	220	220	206	190	172	153	135	117	100
18	SEP	238	238	238	238	224	208	190	171	153	135	118
17	OCT	255	255	255	255	241	225	207	188	170	152	135
15	NOV	270	270	270	270	256	240	222	203	185	167	150
	DEC											
0	JAN											
0	FEB											
0	MAR											
14	APR	284	284	284	284	270	254	236	217	199	181	164
16	MAY	300	300	300	300	286	270	252	233	215	197	180
18	JUN	318	318	318	318	304	288	270	251	233	215	198
19	JUL	337	337	337	337	323	307	289	270	252	234	217
18	AUG	355	355	355	355	341	325	307	288	270	252	235
18	SEP	373	373	373	373	359	343	325	306	288	270	253
17	OCT	390	390	390	390	376	360	342	323	305	287	270
15	NOV	405	405	405	405	391	375	357	338	320	302	285
0	DEC											
0	JAN											
0	FEB											
0	MAR											
14	APR	419	419	419	419	405	389	371	352	334	316	299
16	MAY	435	435	435	435	421	405	387	368	350	332	315
18	JUN	453	453	453	453	439	423	405	386	368	350	333
19	JUL	472	472	472	472	458	442	424	405	387	369	352
18	AUG	490	490	490	490	476	460	442	423	405	387	370
18	SEP	508	508	508	508	494	478	460	441	423	405	388
17	OCT	525	525	525	525	511	495	477	458	440	422	405
15	NOV	540	540	540	540	526	510	492	473	455	437	420
0	DEC											

SETTING OF WORK DAYS FOR BRIDGE CONTRACTS

When setting days for bridge contracts, it is usually best to establish the time required to accomplish each project by assigning time for each controlling operation involved.

To illustrate this let's look at three different jobs, the first being an overlay project. This contract would be set up for calendar day restriction:

1. The first operation would be widening the shoulders. No time charged because this operation can be done without full time restriction.

2. Traffic control items - signals and barrier wall. Probably three to four days unless exceptionally long barrier wall.

3. Scarifying the deck - one day, if it takes longer because of size the next operation will overlap and control.

4. Placing or forming full depth patches - plus curing time - this item depends on quantity.

5. Handchipping and removals - usually two to three days per span.

6. Forming and pouring concrete rail - usually 24 to 36 lineal meter per day.

7. Sandblast and clean deck - usually one day operation.

8. Overlay - usually one day operation.

9. Curing of Overlay - three days.

10. Bituminous approach and installation of guardrail - normally two days operation, unless full depth approach dictates cooling time between lays.

11. Transferring traffic to next phase or removal of traffic control devices. - one day.

Another job used to illustrate the procedure is a three span steel beam contract using a temporary runaround. This job would be set on work days.

1. Construction temporary runaround. Depends on quantity of dirt and length of temporary structure. Use 300 to 500 M^3 of fill per day with structure construction overlap.

2. Removal of present structure - depends on size and type of structure. Consider structure removal phases, be reasonable, also consider phase overlap. (One day per bent, includes superstructure.)

3. Construction of two piers in water - construct cofferdam (if required) four-six days, excavate cofferdam - one day, drive piling - five-10 piles per day depending on driving conditions - look at borings and tip. Form and pour footing - one day - unless mandatory joints, pier stem - two days per pour, hammerhead caps - two days, caps on columns - two days plus additional days when delays are shown on plans between construction joints.

4. Construction of the end bents - usually assume the dirt work on a bridge replacement is being done while the piers are being constructed. If the grade is being raised (or lowered) or has new alignment, use road procedure to assign time to dirt operation. Drive piling - five piles per day plus a day to core if required. Form and pour end bents - two days.

5. Setting of structural steel - usually two to three weeks.

6. Forming the decks - usually four to five days.

7. Placing resteel - usually three to four days. (9 metric tons/day).

8. Pouring deck - one day. (380 M^3 or less in deck).

9. Form and pour mudwalls - one day each, cure - three days.

10. Backfill and placing R.C. approach slab - 24' wide - two days each - three days cure before access to bridge.

11. Forming and pouring concrete rail - 24 to 36 lineal meters per day - three days cure.

12. Bituminous approaches - based on quantities to be placed and cool time between lays.

13. Guardrail - based on quantities to be installed (See road progress sheets).

14. Removal of temporary runaround - about five days. (460 to 700 $meters^3$ removed/day and one to two days to remove temporary structure per span.)

15. Wreck and clean-up - usually five days.

16. Sodding and seeding are miscellaneous items usually accomplished during something else.

Another is a three span slab-top on pile bents with the road being closed. This would be set as a calendar date or number of calendar days to be closed.

1. Closed road - 1/2 day.

2. Remove present structure - depends on size and type of structure. (One day per bent, includes span.)

3. Drive piles for bents - Five to 10 piles per day depending on driving conditions - look at boring and tip required.

4. Construction of end bents - 250 m^3/day for small quantities of fill, one day to core for piling if required - five to 10 piles per day.

5. Falsework and forms - usually two to three weeks.

6. Placing resteel - usually three to four days (9 metric tons/day).

7. Pouring deck - one day (380 M^3 or less in pour).

8. Backfill and place R.C. approach slab - 24' wide - two days each - three days cure before access to bridge.

9. Form and pour concrete rail - 24 to 36 lineal meters per day.

10. Bituminous approaches - based on quantities and cool time between lays.

11. Guardrail - based on quantities (see progress charts).

12. Cleanup- and traffic markings - usually five days.

13. Sodding and seeding - usually done concurrent with other operations.

After days are set, the considerations outlined previously should be evaluated. Are schools, businesses, farmers, other contracts, etc., affected? Will material procurement control job? How will permit restrictions control the schedule? Are there utility considerations?

Assume that only one crew will be used on small bridge jobs. Multiple operations can be used on larger bridges or possibly multiple bridges. Assume five day work week on state and county work. Assume six day work week on interstate work.

When setting days a) most LPA jobs use work days.
b) state jobs with temporary runaround use work days.
c) interstate restrictions are always calendar days.
d) all state highway closures are calendar days.
e) all state highway restrictions to one lane are calendar days.

Be lenient when possible but tight when necessary. The more you can encourage additional bidders, the better potential for lower bid prices.