



1

HOUSEKEEPING

- STP Student Rules
 - Class will be from 5:00-8:00 PM. I will stay after a few moments for discussion and questions.
 - *Microsoft One Note
 - *Scheduling Software
 - *Microsoft Excel

STP UNIT 1 LEADERSHIP AND MOTIVATION 1-2

2

Introductions

 **UNIT 1** LEADERSHIP AND MOTIVATION 

3


 **Matthew Semerad**

AWARDS

- AASHTO Excellence in Utility Accommodation and Relocation: Construction Management
- University of MN Dean's List
- Eagle Scout- Boy Scouts of America
- Commendation from the Sons of the American Revolution
- Completion of Army Leadership Education Training (C/CPT)

CERTIFICATIONS

- Canadian Welding Bureau: Certified Welding Supervisor 1/09
- Radiation Safety Officer Certifications 01/10
- Transportation of Dangerous Goods: 3/10
- MNDOT Tech ID 15395: Aggregate Production
- MNDOT Tech ID 15395: Concrete Field Tech Level 1
- MNDOT Tech ID 15395: Concrete Field Tech Level 2
- MNDOT Tech ID 15395: Grading and Base Level 1
- MNDOT Tech ID 15395: Bituminous Roadway Level 1
- MNDOT ADA Construction Certification 03/22
- University of Minnesota Erosion and Stormwater Construction Site Management (SWPPP)
- Army Corps of Engineer QCS Training
- OSHA 30 Certification 04/12
- NETTOP QA Technologies: 12/2021
- OSHA 10 Certification 03/19
- E-Railsafe: 03/19
- BNSF Roadway Worker Protection 03/19
- OSHA 510: 04/21





CHASE-Partnership.org/mn.org

 Safety and Education Development: Housekeeping

4

WE ARE Learning Organization

- ... **A learning organization** is an **organization** skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights (CIP.)
- This definition begins with a simple truth: new ideas are essential if **learning** is to take place.
- Therefore... I AM A FACILITATOR, NOT A TEACHER



UNIT **1** LEADERSHIP AND MOTIVATION



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Planning vs Scheduling? (1-1)

- '**Project planning**' is all about choosing and designing effective policies and methodologies to attain project objectives. While '**Project scheduling**' is a procedure of assigning tasks to get them completed by allocating appropriate resources within an estimated budget and time-frame.



UNIT **3** PLANNING AND SCHEDULING



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Planning vs Scheduling? (1-1)

- Planning deals with **what** operations we need to perform and **how** do we need to perform the operations. Whereas scheduling is concerned with **who (***)** will perform the operations and **when** the operations will be performed



UNIT **3** PLANNING AND SCHEDULING



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AGC'S SUPERVISORY TRAINING PROGRAM



UNIT **3** PLANNING AND SCHEDULING

SESSION 2

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Proper Planning & Scheduling (2-1)

Why Proper planning:

- Saves money by reducing wasted time.
- *Avoids delays.* **Reduces delays in project completion.**
- Avoids conflicts with project participants, such as the architect, engineer, suppliers and specialty contractors.
- Increases the quality of the project. **(whatis?)**



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Preparing the Project Plan (2-2)

- The project plan consists of activities in sequential order.
- Steps in project plan:
 - Define activities, including scope.
 - Determine activity durations.
 - Arrange activities in a logical sequence.

Define Activities



Determine Activity Durations



Arrange Activities in Logical Sequence



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Defining Construction Activities

(2-2)

- **Activity:** a specific task in the project that has a distinct beginning, a distinct end, and requires a specific amount of time.
 - The project is an accumulation of many activities that are carried out in a logical and interdependent sequence.



UNIT 3 PLANNING AND SCHEDULING



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An Activity... (2-3)

- Is a specific task.
- Has a beginning and an end. (2-3)
- Has a duration (minutes, hours, days, etc.)(2-2)
- Usually consumes resources. (2-3)
 - Material, labor, equipment, specialty contractors
 - (ex. no resource?)
- Is assignable (someone does it).(2-3)
- Is measurable in quantity or time.(2-3)
- Has a relationship to other activities.(2-3)
 - (pred-suc)
- Has delivery associated with it.(2-3)



UNIT 3 PLANNING AND SCHEDULING



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Activity Scope (2-4)

- Relates to quantity of installation and time.
- Relates to size of project.
- Relates to crew size and number of crews.
- Relates to detail required by contract documents.
- Relates to the amount of jobsite control of the schedule.



Comparison of Activity Detail

(2-4)

• FRP Footings

- Layout footings.
- Form footings.
- Footing Reinforcing Steel
- Pour footings.

- Layout footings.
- Form footings.
- Footing Reinforcing Steel
- *Chamfer/Embeds
- *Set Bearings/Bolts
- Pour footings.
- *Cure Footings
- *Strip Footings
- *Point and Patch



Duration of Activities(2-4,5)

- The amount of time between the start and the finish of the activity
- Usually in “days” in construction schedules (“Day” = working day)
- Need to make accurate estimate of time.
- Account for minor delays in activity duration.
- **What is sand bagging? (15 activities)**



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Methods of Estimating Duration (2-5)

- Convert labor hours from cost estimate.
- Estimate time for specific crew.
- Production output from estimating manuals (**RS Means**)
- Specialty contractor input
- Supplier input
- Dependent duration to pace-setting activity
- ****Parkinsons Law****



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Putting the Activities Together (2-6)

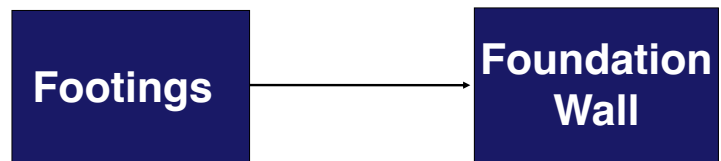
- Assemble activities in “logical sequence.”
 - What is?
- How are we going to build the project?
- No right or wrong way? — superintendent’s viewpoint.
- Always trying to be efficient.
- Continuous flow of work.



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Activity Relationships

- **Finish-to-Start (FS) (2-7)**
 - Activity must be complete before next activity starts.
 - Example: Footings before foundation wall.

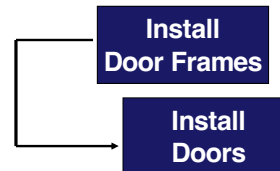


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Activity Relationships

- **Start-to-Start (SS) (2-7)**

- Start of the second activity is related to the start of the first activity.
- Could be a separation of time, or *lag* between the starts.



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Activity Relationships

- **Finish-to-Finish (FF) (Rare – Ill Explain – 2-7)**

- The finish of the first activity must be complete before the finish of another activity.
- *Lags* can be used.

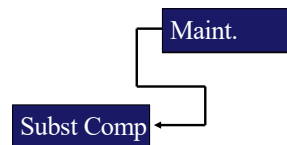


20

Activity Relationships

- **Start-to-Finish (SF) (??? 2-8)**

- One activity cannot finish until the other activity is started.
- Not used as frequently as the other relationships.



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Activity Relationships: Homework Get Comfortable *Read and Re-read

- **Activity : 2-2 (defined)**

- *Size and Scope (2-4)*
- *Duration (2-5)*

- **Activity Relationships (2-7)**

- *F-S (2-7)*
- *S-S (2-7)*
- *F-F (2-7)*
- *S-F (2-8)*

- **Choose any scope of work and make a 15 item schedule with the above info.**




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Learning Objectives

- Identify and prepare a conceptual estimate.
- Review quantity take-offs.
- ~~• Perform take-offs.~~
- Review the pricing of an estimate and compile an estimate.
- ~~• Complete a subcontractor selection process and select subcontractors for an estimate.~~



UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



2-2

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The Conceptual Estimate (2.2)

- Developed early in project development.
- Limited accuracy. **(term : WAG)**
 - Large contingency may be required (depending on contractor’s database).
- Usually based on simple parameters. **(my exp.)**
 - Such as gross area multiplied by the square foot cost for similar projects.
- Helps the owner make basic decisions about moving forward with the project.
- **Initial decision about getting involved.**



A Simple Conceptual Estimate (2.3)

Item	Type	Area	SF Cost	Total Cost
Building A	Office Building	20,000	\$100.00	\$2,000,000
Building B	Warehouse	65,000	\$65.00	\$4,225,000
Site Development		225,000	\$2.00	\$450,000
Site Utilities		225,000	\$1.50	\$337,500
Parking Lots		50,000	\$2.20	\$110,000
Landscaping		90,000	\$1.30	\$117,000
				\$7,239,500
Contingency (HIGH?)			20%	\$1,447,900
Total Construction Costs				\$8,687,400

Figure 2.1



Step 2 : Owner Quantities Issued

GRAND AVENUE PEDESTRIAN IMPROVEMENTS - STATEMENT OF ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
2021 501	Mobilization	LUMP SUM	1
2102 501	PAVEMENT MARKING REMOVAL	SQ FT	25
2102 502	PAVEMENT MARKING REMOVAL	LN FT	1035
2104 501	REMOVE CONCRETE CURB & GUTTER	LN FT	1088
2104 502	REMOVE CONCRETE BUS STOP PAD	SQ YD	107
2104 505	REMOVE CONCRETE BASE	SQ YD	805
2104 505	REMOVE BITUMINOUS PAVEMENT	SQ YD	997
2104 505	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ YD	25
2104 505	REMOVE TRENCH PAVEMENT	SQ YD	492
2104 509	REMOVE CATCH BASIN OR MANHOLE	EACH	11
2104 511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LN FT	1658
2104 513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LN FT	2102
2104 523	SALVAGE SIGN TYPE C	EACH	6
2104 523	SALVAGE SIGN PANEL TYPE C	EACH	6
2104 618	REMOVE BRICK PAVERS	SQ FT	209
2105 501	COMMON EXCAVATION	CU YD	97
2123 610	STREET SWEEPER (WITH PICK UP BROOM)	HOUR	50
2130 501	WATER	M GALLON	73
2211 603	AGGREGATE BASE (C) CLASS 5	SQ YD	198
2301 604	CONCRETE BASE	SQ YD	142
2301 504	CONCRETE PAVEMENT (BUS PARKING PAD)	SQ YD	113
2301 602	DRILL & GROUT DOWEL BAR(EPOXY COATED)	EACH	230
2367 602	BITUMINOUS MATERIAL FOR TACK COAT	GALLON	50
2360 501	TYPE SPWE440F WEARING COURSE MIXTURE	TON	71
2360 502	TYPE SPNWB330B NON-WEARING COURSE MIXTURE	TON	47
2503 541	16" R.C PIPE SEWER, DESIGN 3006 CLASS V	LN FT	445
2506 602	ADJUST MANHOLE CASTING ASSEMBLY 6" TO 6"	EACH	5
2506 602	CONNECT TO EXISTING STRUCTURE	EACH	6
2506 602	CONSTRUCT CATCH BASIN TYPE 7B	EACH	11
2506 602	CONSTRUCT TYPE IV MANHOLE	EACH	4
2521 501	8" CONCRETE WALK	SQ FT	5434
2521 618	8" CONCRETE WALK SPECIAL	SQ FT	305
2531 501	CONCRETE CURB	LN FT	434
2531 501	CONCRETE CURB & GUTTER DESIGN B-606	LN FT	598
2531 501	CONCRETE CURB & GUTTER DESIGN B-624	LN FT	543
2531 507	8" CONCRETE DRIVEWAY PAVEMENT	SQ YD	14
2531 618	TRUNCATED DOMES	SQ FT	448
2540 618	BRICK PAVERS	SQ FT	22
2563 601	TRAFFIC CONTROL	LUMP SUM	1
2564 531	SIGN PANEL TYPE C	SQ FT	12
2564 536	INSTALL SIGN PANEL TYPE C	EACH	6
2564 537	INSTALL SIGN TYPE C	EACH	6
2564 552	OBJECT MARKER TYPE X4-5	EACH	20

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Step 2 : Owner Quantities Issued

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2564 531	SIGN PANEL TYPE C	SQ FT	12
2564 536	INSTALL SIGN PANEL TYPE C	EACH	6
2564 537	INSTALL SIGN TYPE C	EACH	6
2564 552	OBJECT MARKER TYPE X4-5	EACH	20

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Concrete Quantity Take-Off

Item	Cost Item	Quantity	Unit
Grade Beams	Form Beam Sides	30,000	SFCA
	Reinforcing Steel	23.7	Tons
	Place Concrete	611	CY
	Chamfer Strips	2,500	LF
	Float Top	2,500	SF
	Embeds	1,250	Each
Slab-on-Grade (Sidewalk)	Fine Grade	250,000	SF
	Compacted Base Course	3,361	CY
	Vapor Barrier	282,500	SF
	Reinforcing Steel	183.7	Tons
	Edge Form	2,500	LF
	Screeds	5,000	LF
	Expansion Joint	4,881	LF
	Finish	250,000	SF
	Cure	250,000	SF
	Box-Out Columns	108	SF

Completed Form 2.2



Concrete Quantity Take-Off (deep in the weeds)

Project	Concrete Recap Sheet				Labor			Material			
	Cost code	Item	Quantity	Unit	Unit/hr	Man-hours	Cost/hr	Total Labor	Unit Cost	Total Mat	Total Cost
03.03.03	Grade Beams										
03.03.03.01	Form Beam Sides	30,000	SFCA	10	3000	\$45.00	\$ 135,000	\$ 0.35	\$ 10,500	\$ 145,500	
03.03.03.02	Reinforcing Steel	23.7	Ton	0.0375	632	\$50.00	\$ 31,600	\$500.00	\$ 11,850	\$ 43,450	
03.03.03.03	Place Concrete	611	CY	3	204	\$42.00	\$ 8,554	\$ 52.00	\$ 31,772	\$ 40,326	
03.03.03.04	Chamfer Strips	2,500	LF	200	13	\$45.00	\$ 585	\$ 0.10	\$ 250	\$ 833	
03.03.03.05	Float Top	2,500	SF	300	8	\$42.00	\$ 336	\$ -	\$ -	\$ 336	
03.03.03.06	Embeds	1,250	Ea	3	417	\$50.00	\$ 20,833	\$ 17.00	\$ 21,250	\$ 42,083	
	Total Grade Beams						\$ 196,900		\$ 75,622	\$ 272,522	
03.03.04	Slab-on-Grade (sidewalk)										
03.03.04.01	Fine Grade	250,000	SF	400	625	\$42.00	\$ 26,250	\$ -	\$ -	\$ 26,250	
03.03.04.02	Slab Gravel	3,361	CY	5	672	\$42.00	\$ 28,224	\$ 10.50	\$ 35,281	\$ 63,505	
03.03.04.03	Vapor Barrier	282,500	SF	1000	283	\$42.00	\$ 11,885	\$ 0.02	\$ 5,650	\$ 17,535	
03.03.04.04	Reinforcing Steel	183.7	Ton	0.05	3674	\$50.00	\$ 183,700	\$500.00	\$ 91,850	\$ 275,550	
03.03.04.05	Edge Form	2,500	LF	20	125	\$45.00	\$ 5,625	\$ 1.00	\$ 2,500	\$ 8,125	
03.03.04.06	Screeds	5,000	LF	40	125	\$45.00	\$ 5,625	\$ 0.30	\$ 1,500	\$ 7,125	
03.03.04.07	Expansion Joint	4,881	LF	40	224	\$45.00	\$ 10,125	\$ 0.32	\$ 2,590	\$ 12,715	
03.03.04.08	Place Concrete	3,361	CY	2	2431	\$42.00	\$ 102,061	\$ 52.00	\$ 252,772	\$ 354,833	
03.03.04.09	Finish	250,000	SF	120	2083	\$42.00	\$ 87,500	\$ -	\$ -	\$ 87,500	
03.03.04.10	Cure	250,000	SF	1000	250	\$42.00	\$ 10,500	\$ 0.06	\$ 15,000	\$ 25,500	
03.03.04.11	Box-Out Columns	108	SF	6.5	17	\$45.00	\$ 768	\$ 2.50	\$ 220	\$ 1,018	
	Total Slab-on-Grade						\$ 472,254		\$ 407,213	\$ 879,464	

Pricing for Form 2.2



**DO MORE BY
DOING
LESS**

STP UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS 2-15

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Concrete Quantity Take-Off (deep in the weeds)

The 80-20 rule, also known as the Pareto Principle, is a familiar saying that asserts that 80% of outcomes (or outputs) result from 20% of all causes (or inputs) for any given event. In business, a goal of the 80-20 rule is to identify inputs that are potentially the most productive and make them the priority.

- 80% of your success comes from 20% of your ideas.
- 80% of the public uses 20% of their computers' features.
- 80% of crimes are committed by 20% of criminals.
- 80% of sales are from 20% of clients.

...80% of your monthly expenses come from...

STP UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS 2-15

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Vital Few / Useful Many

Project	Concrete Recap Sheet				Labor		Unit Cost	Material	Total Cost	
	Cost code	Item	Quantity	Unit	Unit/Thr	Man-hours				Cost/Thr
03.03.03	Grade Beams									
03.03.03.01	Form Beam Sides	30,000	SFCA	10	3000	\$45.00	\$ 135,000	\$ 0.35	\$ 10,500	\$ 145,500
03.03.03.02	Reinforcing Steel	23.7	Ton	0.0375	632	\$50.00	\$ 11,600	\$500.00	\$ 11,650	\$ 43,450
03.03.03.03	Place Concrete	611	CY	3	204	\$42.00	\$ 8,554	\$ 52.00	\$ 11,722	\$ 40,326
03.03.03.04	Chamber Strips	2500	LF	200	13	\$45.00	\$ 953	\$ 0.10	\$ 250	\$ 813
03.03.03.05	Float Top	2500	SF	300	3	\$42.00	\$ 350	\$ -	\$ -	\$ 350
03.03.03.06	Embeds	1250	Ea	3	417	\$50.00	\$ 20,833	\$ 17.00	\$ 21,250	\$ 42,083
	Total Grade Beams				4273		\$ 196,900		\$ 75,622	\$ 272,522
03.03.04	Slab-on-Grade									
03.03.04.01	Fine Grade	250000	SF	400	625	\$42.00	\$ 26,250	\$ -	\$ -	\$ 26,250
03.03.04.02	Slab Gravel	3361	CY	5	672	\$42.00	\$ 28,232	\$ 10.50	\$ 35,291	\$ 63,523
03.03.04.03	Vapor Barrier	282500	SF	1000	283	\$42.00	\$ 11,865	\$ 0.02	\$ 5,650	\$ 17,515
03.03.04.04	Reinforcing Steel	183.7	Ton	0.05	3674	\$50.00	\$ 183,700	\$500.00	\$ 91,650	\$ 275,550
03.03.04.05	Edge Form	2500	LF	20	125	\$45.00	\$ 5,625	\$ 1.00	\$ 2,500	\$ 8,125
03.03.04.06	Scams	5000	LF	40	125	\$45.00	\$ 5,625	\$ 0.30	\$ 1,500	\$ 7,125
03.03.04.07	Expansion Joint	6000	LF	40	225	\$45.00	\$ 10,125	\$ 0.32	\$ 2,560	\$ 13,005
03.03.04.08	Place Concrete	4861	CY	2	2431	\$42.00	\$ 102,061	\$ 52.00	\$ 252,722	\$ 354,883
03.03.04.09	Finish	250000	SF	120	2083	\$42.00	\$ 87,500	\$ -	\$ -	\$ 87,500
03.03.04.10	Cure	250000	SF	1000	250	\$42.00	\$ 10,500	\$ 0.06	\$ 15,000	\$ 25,500
03.03.04.11	Box-Out Columns	108	SF	6.5	17	\$45.00	\$ 748	\$ 2.50	\$ 270	\$ 1,018
	Total Slab-on-Grade				10599		\$ 472,251		\$ 407,713	\$ 879,964

Pricing for Form 2.2



UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



2-15

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Vital Few / Useful Many

Project	Concrete Recap Sheet				Labor		Unit Cost	Material	Total Cost	
	Cost code	Item	Quantity	Unit	Unit/Thr	Man-hours				Cost/Thr
03.03.03	Grade Beams									
03.03.03.01	Form Beam Sides	30,000	SFCA	10	3000	\$45.00	\$ 135,000	\$ 0.35	\$ 10,500	\$ 145,500
03.03.03.02	Reinforcing Steel	23.7	Ton	0.0375	632	\$50.00	\$ 11,600	\$500.00	\$ 11,650	\$ 43,450
03.03.03.03	Place Concrete	611	CY	3	204	\$42.00	\$ 8,554	\$ 52.00	\$ 11,722	\$ 40,326
03.03.03.04	Chamber Strips	2500	LF	200	13	\$45.00	\$ 953	\$ 0.10	\$ 250	\$ 813
03.03.03.05	Float Top	2500	SF	300	3	\$42.00	\$ 350	\$ -	\$ -	\$ 350
03.03.03.06	Embeds	1250	Ea	3	417	\$50.00	\$ 20,833	\$ 17.00	\$ 21,250	\$ 42,083
	Total Grade Beams				4273		\$ 196,900		\$ 75,622	\$ 272,522
03.03.04	Slab-on-Grade									
03.03.04.01	Fine Grade	250000	SF	400	625	\$42.00	\$ 26,250	\$ -	\$ -	\$ 26,250
03.03.04.02	Slab Gravel	3361	CY	5	672	\$42.00	\$ 28,232	\$ 10.50	\$ 35,291	\$ 63,523
03.03.04.03	Vapor Barrier	282500	SF	1000	283	\$42.00	\$ 11,865	\$ 0.02	\$ 5,650	\$ 17,515
03.03.04.04	Reinforcing Steel	183.7	Ton	0.05	3674	\$50.00	\$ 183,700	\$500.00	\$ 91,650	\$ 275,550
03.03.04.05	Edge Form	2500	LF	20	125	\$45.00	\$ 5,625	\$ 1.00	\$ 2,500	\$ 8,125
03.03.04.06	Scams	5000	LF	40	125	\$45.00	\$ 5,625	\$ 0.30	\$ 1,500	\$ 7,125
03.03.04.07	Expansion Joint	6000	LF	40	225	\$45.00	\$ 10,125	\$ 0.32	\$ 2,560	\$ 13,005
03.03.04.08	Place Concrete	4861	CY	2	2431	\$42.00	\$ 102,061	\$ 52.00	\$ 252,722	\$ 354,883
03.03.04.09	Finish	250000	SF	120	2083	\$42.00	\$ 87,500	\$ -	\$ -	\$ 87,500
03.03.04.10	Cure	250000	SF	1000	250	\$42.00	\$ 10,500	\$ 0.06	\$ 15,000	\$ 25,500
03.03.04.11	Box-Out Columns	108	SF	6.5	17	\$45.00	\$ 748	\$ 2.50	\$ 270	\$ 1,018
	Total Slab-on-Grade				10599		\$ 472,251		\$ 407,713	\$ 879,964

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UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



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The Detailed Estimate

- Identifies assembly elements.
- Detailed take-off of material quantities.
- The more detailed the estimate, the more accurate the estimate can be.
 - As the documents increase in detail, the estimate increases in detail, and the included contingency (risk) decreases.
 - More accurate than the conceptual estimate.
 - Little or no contingency is added.



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The Detailed Estimate

The Detailed Estimate Includes:

- A break down of the work by categories of similar items or as required by the bid form. (remember 6" sidewalk)
- Quantification of similar elements of work for each category for costing. (proj. ctrl.)
- Determination of a construction plan.
- Determination of a construction schedule. (proj. ctrl.)
- An estimate of cost of labor, material, equipment, subcontractors and service providers for each element of each item of work.
- The direct and indirect cost of the work which includes all the cost elements.
- Solicitation and receipt of quotes for materials, services by others and work to be subcontracted.
- A summary of all elements of costs (labor, material, equipment, subcontractors and service providers) to determine the total estimated cost of work.
- Analysis of risk the project should bear.
- Determination of a markup to be added to the cost of work to produce a selling or bid price.



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Creating the Project Budget

(1-18 → 1-23)

Project spread over three years to finance:

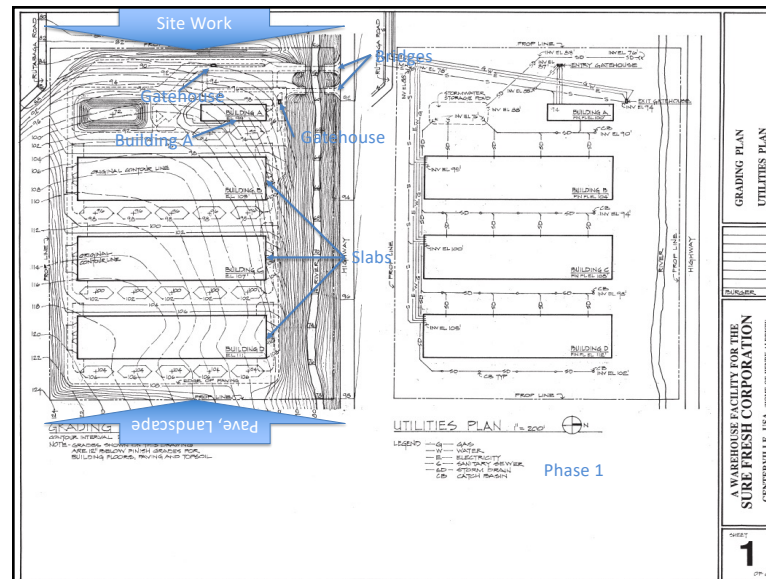
- Phase I: Site work; gatehouses; bridges; Building A for offices; slabs of Buildings B, C, and D; site asphalt paving and landscaping.
- Phase II: Complete three warehouse buildings.
- Phase III: Construction of new office building, remodel Building A.



UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



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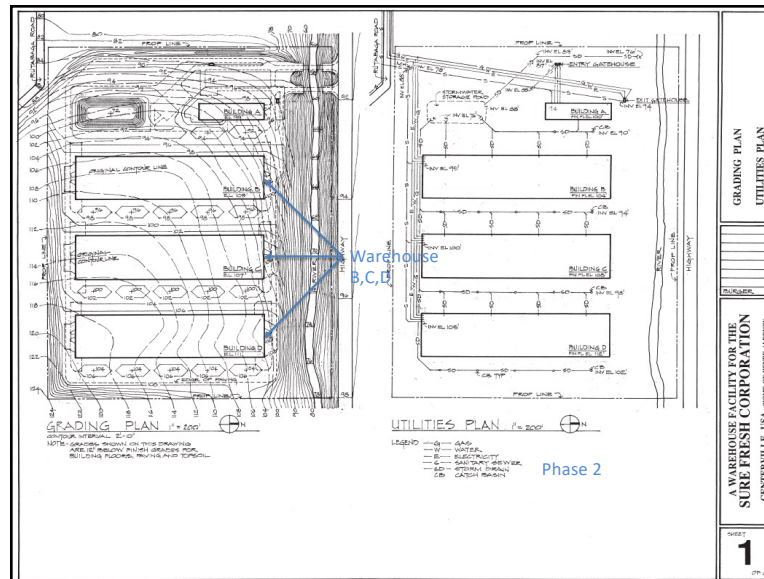
Phase I Budget

Item	Description	Area	Unit	Unit Price	Cost
Phase I					
Site Development	Entire Site Area West of River	2,400,000	SF	\$0.20	\$480,000
Bridges	2 Each @ 3,600 SF Each	7,200	SF	\$100.00	\$720,000
Site Utilities	Entire Site Area West of River	2,400,000	SF	\$0.10	\$240,000
Truck Access Paving		624,483	SF	\$2.72	\$1,698,594
Parking Lots	+90,000 SF North Site	51,750	SF	\$2.09	\$108,158
Landscaping		65,474	SY	\$0.81	\$53,034
Gatehouse 1		200	SF	\$150.00	\$30,000
Gatehouse 2		200	SF	\$150.00	\$30,000
Building A	Receiving Building	35,000	SF	\$38.16	\$1,335,600
Building B	Warehouse, Foundations/Slab	250,000	SF	\$12.00	\$3,000,000
Building C	Warehouse, Foundations/Slab	250,000	SF	\$12.00	\$3,000,000
Building D	Warehouse, Foundations/Slab	250,000	SF	\$12.00	\$3,000,000
					\$13,695,386
20% Contingency					\$2,739,077
Total Phase I Budget					\$16,434,463

Figure 2.3



UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



Phase II Budget

Item	Description	Area	Unit	Unit Price	Cost
Phase II					
Building B	Warehouse Building Completion	250,000	SF	\$21.51	\$5,377,500
Building C	Warehouse Building Completion	250,000	SF	\$21.51	\$5,377,500
Building D	Warehouse Building Completion	250,000	SF	\$21.51	\$5,377,500
					\$16,132,500
20% Contingency					\$3,226,500
Total Phase II Budget					\$19,359,000

Figure 2.3 (Continued)

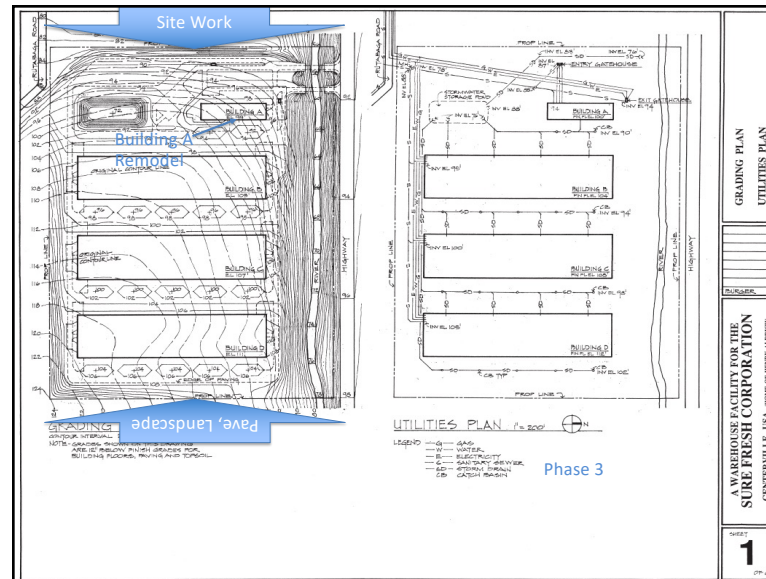


UNIT **5** IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



2-8

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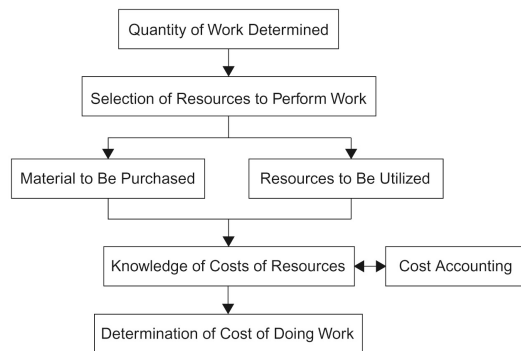
Phase III Budget

Item	Description	Area	Unit	Unit Price	Cost
Phase III					
Building A	Remodel for Receiving	15,200	SF	\$10.00	\$152,000
Office Building	Building	25,000	SF	\$103.43	\$2,585,750
(north site)	Site Development	1,125,000	SF	\$0.20	\$225,000
	Site Utilities	1,125,000	SF	\$0.10	\$112,500
	Asphalt Paved Parking Lots	90,000	SF	\$2.09	\$188,100
	Landscaping	10,000	SY	\$0.81	\$8,100
					\$3,271,450
20% Contingency					\$654,290
Total Phase III Budget					\$3,925,740
Total Project Costs					\$39,719,203

Figure 2.3 (Continued)



Relationship of Estimating, Accounting, and Productivity



Common Estimate Mistakes:

- Thinking in a Vacuum.
- Paying to get work.
- Not listening to the experts.
- Forgetting something.
- Knowing too much.
- Not enough detail.
- Not understanding the contract.
- Poor understanding of exclusions/
scoping.



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Session 2 Review

- Conceptual estimates may be based on specific project areas (measured in SF).
 - Conceptual estimates are used to establish the project budget.
 - Contingencies allow for the uncertainties at a specific time in the project design.
- More detailed estimates are prepared as the documents are completed.
- A take-off of quantities is completed to provide more detail estimates.
 - These quantities are used to estimate labor, material, and equipment.



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Session 2 Review

(Continued)

- Subcontractor selection is completed using an analysis based on the candidates' capabilities, scope and price.
- A **project plan** and **schedule** are usually prepared using either a bar chart (**GANT**) format or a critical path method format.
- An updated project plan is needed to help the supervisor avoid incorrect management decisions.



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Session 2 Summary: Semeradical

(Final)

- A conceptual estimate is rare. Someone experienced with the company quickly can identify a project's magnitude and determine fit.
- During the detailed estimate/ proposal is typically when take-offs occur, however take-offs will be performed throughout the project to determine change in conditions and productivity.
- A budget is typically created at project award. The budget is an extract from the detailed estimate.
- Cost Reports/ Budgets are a **PROJECT CONTROL**.



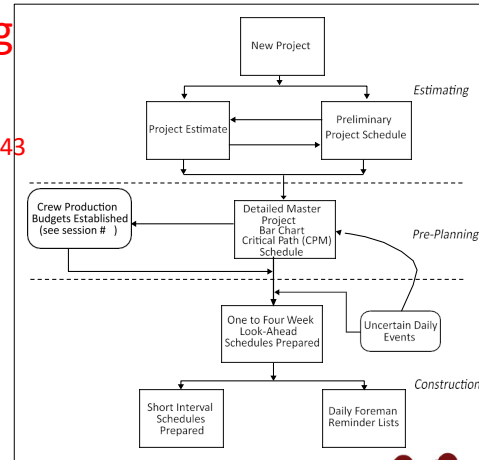
UNIT **5** IMPROVING PRODUCTIVITY
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One Last Thing

- Let's discuss :
 - Diagram on p 2-43



UNIT 5

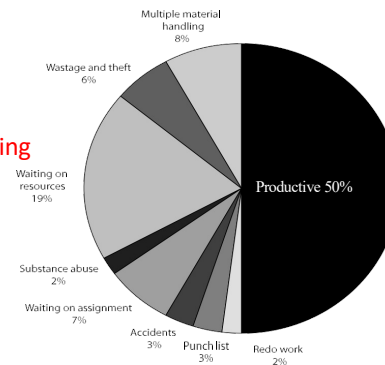
IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



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One Last Thing

- Let's discuss :
 - Diagram on p 2-43
 - Pie Chart on p 2-45
 - Impact of Poor planning



UNIT 5

IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



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One Last Thing

- Chapter Length – 2.1 to 2.76
 - Planning vs scheduling
 - Workforce utilization/ output (balancing)
 - Look ahead schedules
 - The power of pre-planning



UNIT 5 IMPROVING PRODUCTIVITY AND MANAGING PROJECT COSTS



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Unit 3 Sched. & Unit 5 Prod.

Planning And Scheduling
Preparing the project plan
Communicating the plan
The Critical Path
Using the schedule on the job
Updating the schedule
Schedule as documentation

Intro to Improving Productivity
Construction Estimates, Planning and Scheduling
Who controls project costs?
Reporting and analyzing actual costs.
Planning for cost control.
Cost control strategies
Quantifying lost labor productivity.
Equipment management
Working with project partners



UNIT 3 PLANNING AND SCHEDULING



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