

THE ROLE AND VALUE OF THE OWNER'S PROJECT MANAGER (OPM)

Presented By:

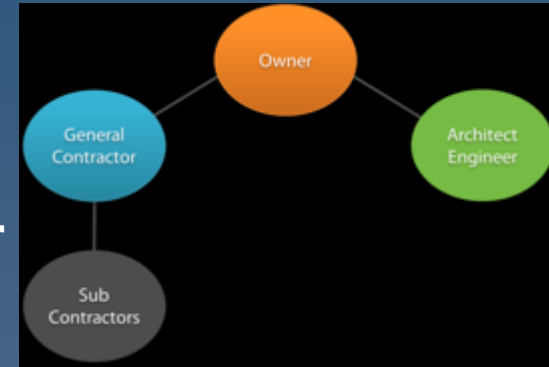
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Environmental Partners Group, Inc.



OPM = OWNER'S PROJECT MANAGER

Basic OPM Function:

- Protect the Owner's interests
- Manage the Designer and Contractor
- Independent, third party
- Minimize surprises (i.e. cost overruns, delays, poor quality control)
- Explain project status and changes to Town, City or Agency's management Board



ROLE AND VALUE

- Applicable to:
 - All Wastewater Facility, Pump station projects
 - More Complex Utility/Pipeline projects
- Role & Value are tangible. Accountability & Transparency
- Role – Watch the Owner's Back;
- Maintain Accountability of Designer and Contractor
- Value....Risk Management, Change Management



APPLICABILITY

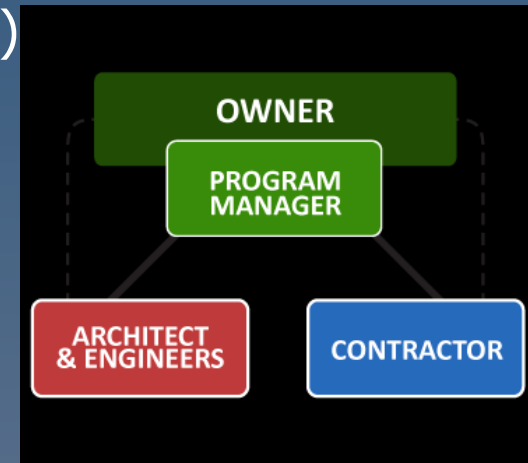
- Applicable to:
 - All Wastewater Facility projects
 - Most Pump station projects, Building
 - More Complex Utility/Pipeline projects
 - VE, Constructability, MOPO, Change Management, Document Control



OUR APPROACH TO OPM

What Really is OPM in its Simplest Terms?

- Protect the Owner's Interests
- Reduce your Management Burden
- Assist with Selection of Designer(s) and Contractor(s)
 - Delivery Method
 - Prepare the RFQ/P
 - Review responses/clarifications/rank/select
 - Smoke out inexperienced firms
- Cost, Schedule and Change Management
 - Reliable Cost Estimates = No Embarrassment at Bid Opening.
 - Minimize Change Orders
- Transparent to Public Scrutiny and Comply with Law (e.g MGL c.149)



OUR APPROACH COORDINATION ACTIVITIES



ROLE OF OPM

- Establish Total Project Scope, Schedule and Budget
- Design Criteria
- Designer Selection
- Review Designer Contract(s) in Detail
- Understand the Communication Lines and Authority
- Develop and Implement a QA program
- Thorough Review of Design and Construction Documents (Plans and Specifications, AE Estimate)
- Independent Cost Estimate, and Reconcile Differences



ROLE OF OPM (continued)

- Cost, Schedule and Change Management
- Early Intervention
- Continuous Planning Ahead During Design and Construction Phases
- Plan for Transition to the Owner as Part of the Testing, Training and Start-up Phase
- Closeout



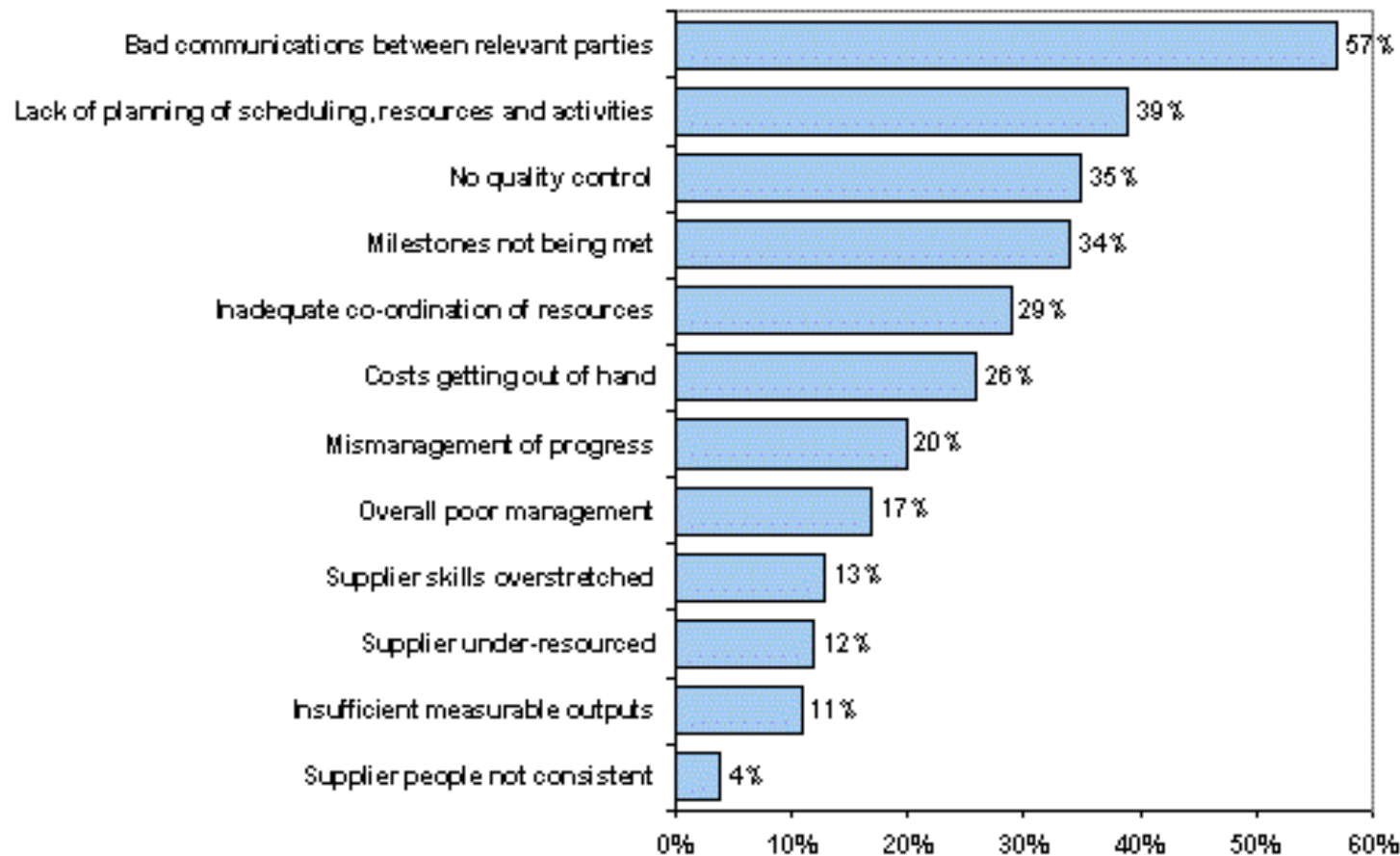
CLEARLY ESTABLISHING THE OWNER'S GOALS AND OBJECTIVES FOR THE PROJECT

- Won't the designer and contractor work together and resolve any problems?
- What should one consider as you approach an OPM-led project?
 - Budget pressures – cut it down as early as possible
 - Funding sources and their schedules e.g. ARRA, Consent Orders
 - Communications
- Lessons learned
 - Fast track projects – can get out of control quickly
 - Stay close to outside funding source managers



AVOID FAILURE

Major Causes Of Project Failure



AVOID FAILURE

Most communities have insufficient staff resources to fulfill this role:

- Don't underestimate the programmatic demands
- Can you be involved with all of these elements?

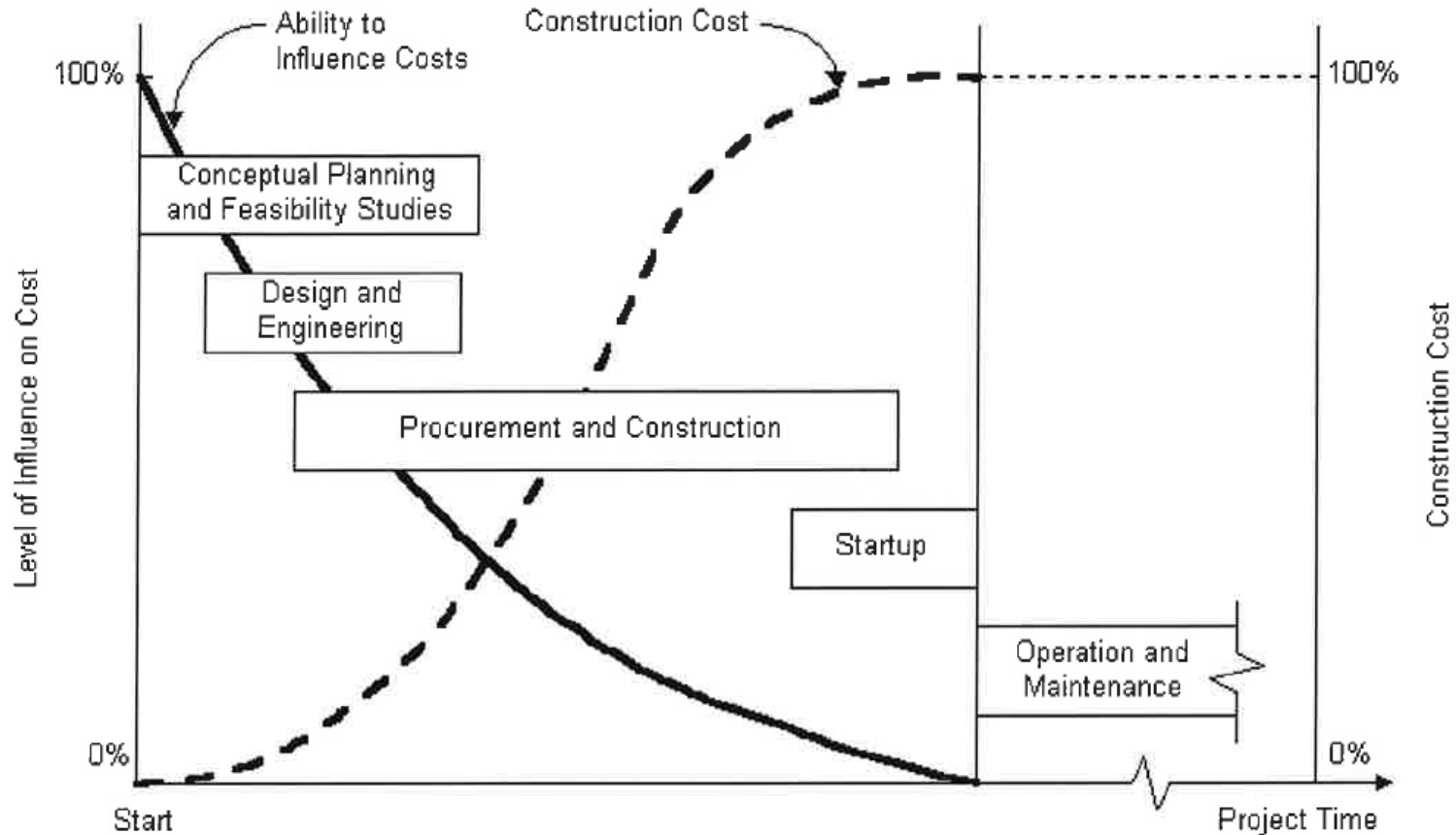


OPM PERSPECTIVES

- Cost and Schedule Control – don't assume the designer or contractor feel Owner's pain.
- Value Engineering—critical to be done early
- Examine Alternatives, Save \$\$ w/o lowering quality
- Watch the Owner's back....the designer and contractor have separate agreements with you (the Owner). You need to be aware of what services are NOT included in their scopes.
- Independent construction estimate and schedule—reality check on Designer estimates.



BENEFIT OF EARLY INTERVENTION



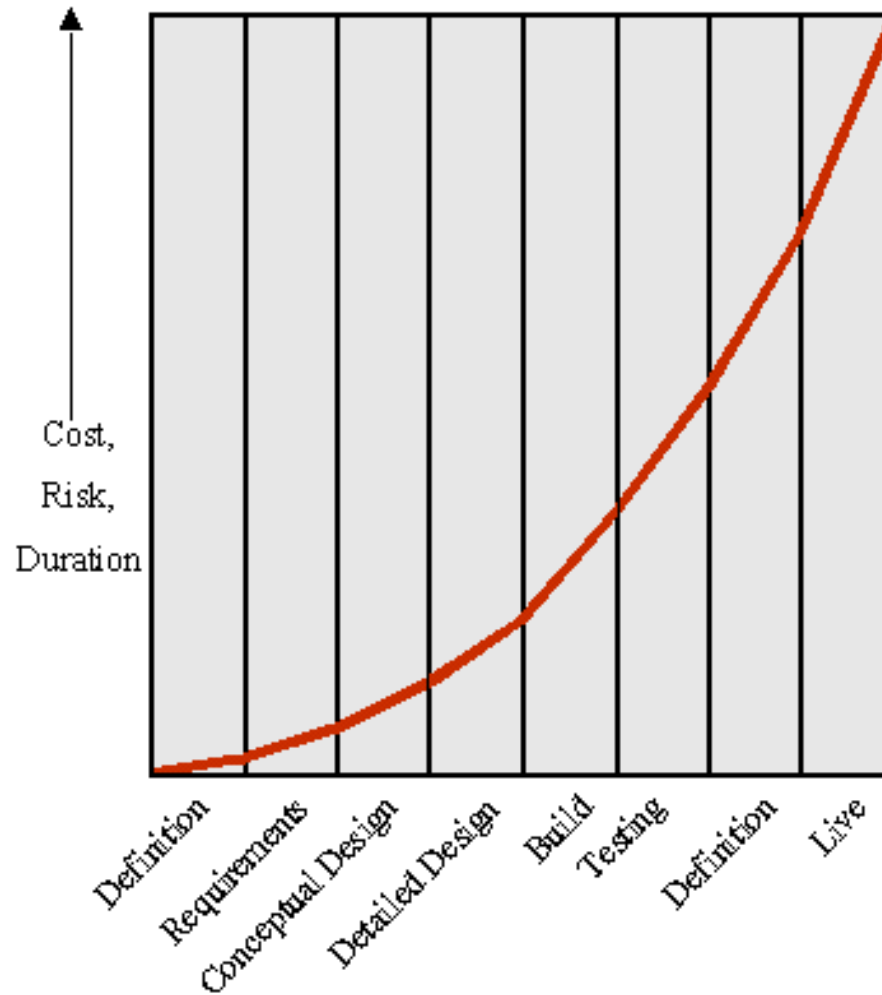
OWNER'S BASIC PROJECT CONSIDERATIONS

Key Questions for the Owner

- Is the Project Scope defined?
- Schedule?
- Budget and Basis?
- Are they realistic?
- Current staff work load?
- How involved or distant to Owner staff want to be?
- Do we know what we are getting into?



The later a change is addressed, the greater the cost, risk and duration



WHEN SHOULD I HIRE ONE?

- Augment the Owner's professional staff
- Someone needs to understand the design, bidding and construction elements.
- Formalized in Massachusetts....Chapter 193 of the Acts of 2004 – new provision of M.G.L. c.149, s.44A 1/2
- Risk Management
- Independent set of eyes



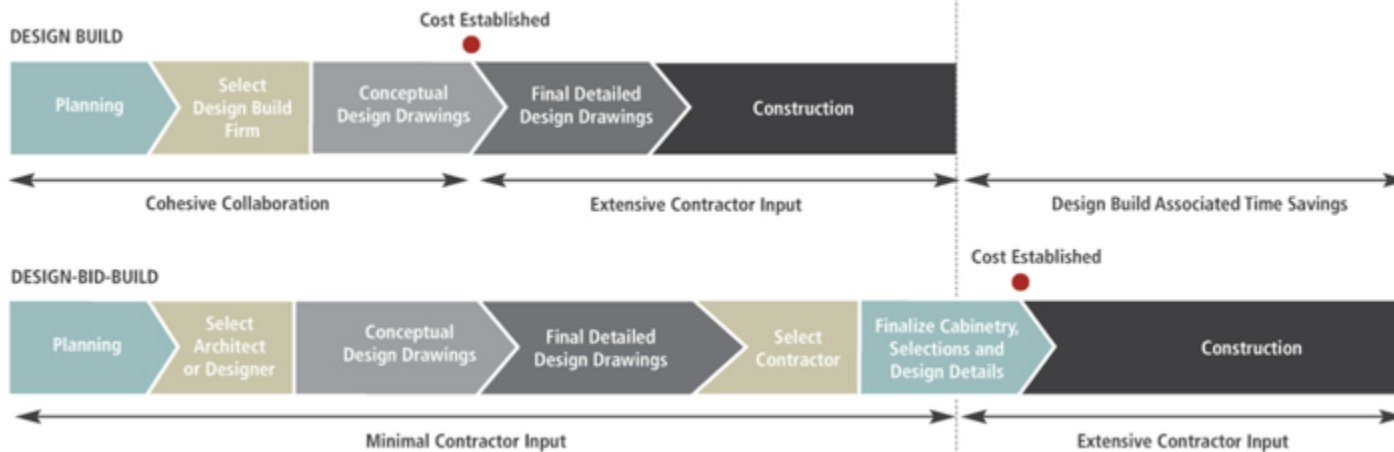
SOME PUSH BACK

- Why do we need another team member?
- Not typically used...?
- More players/more cost?
- Is it really needed?
- Role and Value?



PROJECT DELIVERY METHOD?

- Basic Question: Traditional: Design-Bid-Build
- DB, DBO, CM, CMaR
- Schedule and Cost Drivers



MGL CHAPTER 149 PROJECTS

Massachusetts Law:

- Requires public awarding authorities to engage an OPM for all building projects estimated to cost \$1.5 Million or more
- Hire OPM before designer
- Meet minimal qualification standards
- Select through QBS process
- Owner's agent from design through completion
- Completely independent of designer, contractor, or subs



ESTABLISH THE OWNER'S GOALS AND OBJECTIVES FOR THE PROJECT

- Critical components---Must-have vs. Preferences
- Desired budget and schedule
- Selecting the Engineer/Architect
- Quality Assurance - plans and specs
- Maximizing value for the public



FUNDAMENTAL OPM FUNCTIONS

This is not a part-time assignment!

- Designer Selection – write the Designer’s scope of work and RFQ, and assist with selection.
- Permitting, Design, Bidding, Construction, Commissioning
- Early input is very valuable.
- Independent set of eyes and ears- review preliminary design concepts, and subsequent plans and specs at 30/60/90%.
- Provide Value Engineering Services – great benefit to owner when it is done early.
- Includes suggesting alternative materials and components
 - Save \$ and time.



OWNER'S ROLE

- Often overlooked/under appreciated Owner items
- During Design
 - What equipment do I prefer?
 - Standardize on certain equipment - Consistency, Serviceability, Spare Parts,
 - SCADA/Controls – Simple or Complex? Custom or Open?
 - Design Criteria consensus
- During Construction
 - Phasing of Work
 - Live Work interferences---tie ins; shut downs; bypass pumping, temp electrical services
 - How long can a process be off-line for?
 - Identify early in design and include in plans/specs.



OWNER'S ROLE

- Often overlooked/under appreciated Owner items
- End of Project
 - Construction Completion Inspections
 - Action Items/Punch list Development
 - Oversee Start-Up and Testing Plan
 - Confirm Operational Testing Completeness
 - Oversee Preparation of Operation and Maintenance Manual
 - Oversee Town Operations Staff Training
 - Assist with Contract Closeout
 - Record Drawings



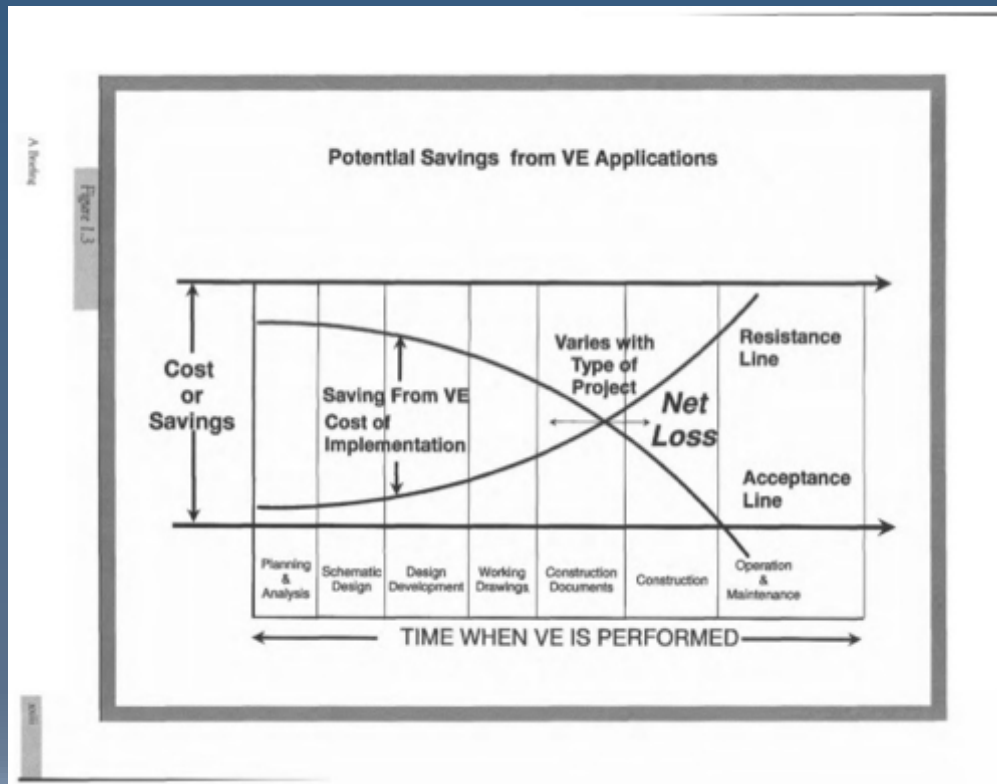
VALUE ENGINEERING

- Preserve Key Functions at a Lower Cost
- Early in Schedule; Before 25%, 50%
- Formal 2 day sessions or Informal
- Options and Costs
 - Site work
 - Process and Equipment
 - Instrumentation & Controls
 - Building HVAC & Electrical, Cogen
 - Generator
- Resolve with Owner & Design Team



VALUE ENGINEERING

- Resolve with Owner & Design Team



VALUE ENGINEERING

- Pipeline: Route, Materials, Trenchless, Paving
- Pump Station: Wetwell, Pumps, VFDs, Building
- Wastewater treatment plant
 - Process: SBR or 5-Stage Bardenpho
 - Concrete Tankage & Equipment
 - SCADA/Instrumentation & Controls
 - Building HVAC & Electrical, Cogen? L
 - Generator
- Resolve with Owner & Design Team



ACCURATE COST ESTIMATING

- Cost Estimates
- Basis:
- Timeline: Conceptual, Schematic, Design Dev, Construct Docs, Bid
- Chronology of Cost Changes
- **Contractors are better estimators than A/E firms!.**



COST ESTIMATE

PROJECT: WATER POLLUTION CONTROL FACILITY (WPCF)
MIDDLEBOROUGH, MA 02346
SUMMARY



COSTPRO, INC.

Code	Item Description	Quantity	Price	Total
1.0	Pretreatment Building			\$489,917
2.0	Control Building			\$2,399,223
3.0	Sand Filter Building			\$1,783,932
4.0	Solids Handling Building			\$1,401,132
5.0	Ferric Chloride Storage Building			\$106,680
6.0	Influent Storage Shed			\$10,992
7.0	Lime Garage-Shed At Clarifiers			\$42,893
8.0	Aerated Grit Tank			\$30,202
9.0	Septic Storage Tanks			\$52,368
10.0	Primary Clarifiers			\$238,441
11.0	Sludge Holding Tank			\$252,226
12.0	Aeration Tanks			\$2,452,548
13.0	Secondary Clarifiers			\$238,441
14.0	Post Chlorination Tank			\$90,252
15.0	Post Treatment Aeration Tank			\$58,990
16.0	Process Equipment (including installation)	by EPG		\$3,049,407
17.0	Instrumentation and Controls			\$500,000
18.0	Site Work			\$400,000
	Total Direct Cost			\$13,597,644
	Phasing Premium	10%		1,359,764
	Continuous Operation Premium - Allowance	5%		747,870
	Total Cost With Premiums			\$15,705,278
	General Conditions, Overhead, & Profit	16%		\$2,512,844
				\$18,218,122
	Design & Price Reserve	20%		\$3,643,624
				\$21,861,746
	Escalation To Bid Date	Jun-14	5.78%	\$1,263,609
				\$23,125,355
	Bond	1.34%		\$309,880
	Total Cost			\$23,435,235



ACCURATE COST ESTIMATING

- Cost Estimate “Range”...
- What does the Range really mean?
- Basis:

COST ESTIMATE CLASSIFICATION MATRIX FOR THE PROCESS INDUSTRIES				
ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges ^[a]
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Notes: [a] The state of process technology, availability of applicable reference cost data, and many other risks affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.



ACCURATE COST ESTIMATING

Chronology of Cost Changes

Summary:		Subtotal			
Description	Oct-13	Feb-14	Jun-14	Sep-14	
Demolition	\$ 609,900	\$ 549,400	\$ 588,500	\$ 798,100	
Civil	\$ 828,400	\$ 841,500	\$ 872,000	\$ 841,800	
Architectural	\$ -	\$ -	\$ -	\$ -	
Structural	\$ 2,426,100	\$ 2,250,200	\$ 2,210,200	\$ 2,518,700	
Process	\$ -	\$ -	\$ -	\$ -	
Mechanical	\$ 1,829,773	\$ 1,915,500	\$ 2,061,600	\$ 1,925,300	
Instr. & Control	\$ -	\$ -	\$ -	\$ -	
Electrical	\$ 6,812,700	\$ 5,755,300	\$ 6,149,000	\$ 6,784,400	
	\$ -	\$ -	\$ -	\$ -	
	\$ 509,600	\$ 474,900	\$ 502,900	\$ 804,100	
	\$ -	\$ -	\$ -	\$ -	
	\$ 738,200	\$ 614,700	\$ 568,000	\$ 802,200	
	\$ -	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	\$ -	
	\$ 3,077,200	\$ 2,987,700	\$ 2,799,100	\$ 3,819,800	
	\$ -	\$ -	\$ -	\$ -	
Subtotal direct cost	\$ 16,831,873	\$ 15,389,200	\$ 15,751,300	\$ 18,294,400	



ACCURATE COST ESTIMATING

Chronology of Cost and Total Cost

Markups:						
General Contractor						
Gen Conditions, OHP	0.15	\$ 2,524,781	\$ 2,308,380	\$ 2,362,695	\$ 2,744,160	
		\$ -	\$ -	\$ -	\$ -	
General Contractor		-	-	-	-	
Markup	0.075	\$ 1,262,390	\$ 1,154,190	\$ 787,565	\$ 263,000	
Elec/Tel		\$ -	\$ -	\$ 50,000	\$ 50,000	
Bonds& Insurance	1.50%	252,478	230,838	\$ 236,270	\$ 274,416	
Unit Price Items		\$ -	\$ -	\$ 185,000	\$ 50,000	
Project Location Mult	0	\$ -	\$ -	\$ -	\$ -	
		\$ -	\$ -	\$ -	\$ -	
Subtotal Constr Costs		\$ 20,871,523	\$ 19,082,608	\$ 19,372,830	\$ 21,675,976	
		\$ -	\$ -	\$ -	\$ -	
Design Contingency	0.15	\$ 3,130,728	\$ 2,862,391	\$ 2,905,924	\$ 1,083,799	
5% Sept		\$ -	\$ -	\$ -	\$ -	
Inflation to midpoint of construction	0.05	\$ 1,043,576	\$ 954,130	\$ 581,185	\$ 650,279	
5% in oct and Feb; 3% in june						
OPM Estimate of Constr Cost		\$ 25.045M	\$ 22.899M	\$ 22.859M	\$ 23.410M	



ACCURATE COST ESTIMATING

Were the estimates "Accurate"?

4 Bids: March 2015

\$21.5---\$21.8-----\$23.5M.....\$25.1M

AE Estimate.....\$22.2M :

OPM Estimate.....\$22.9M

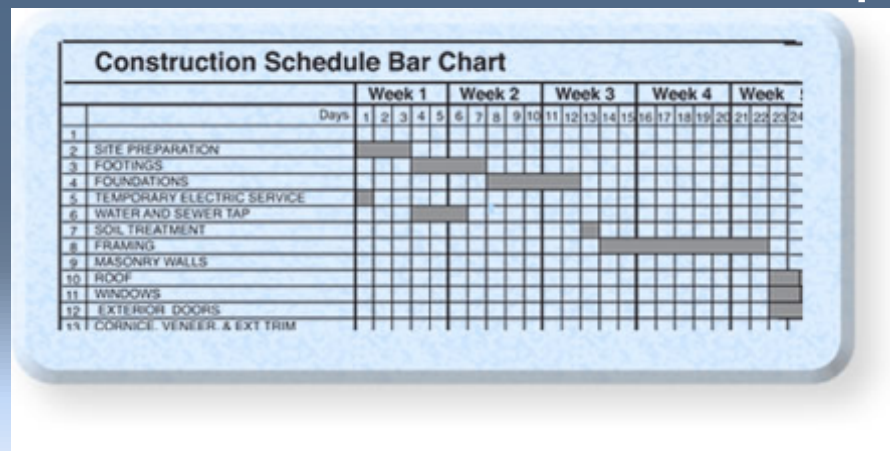
Actual Low Bid-----\$21.5M

Conclusion: Yes, the Estimates were accurate.



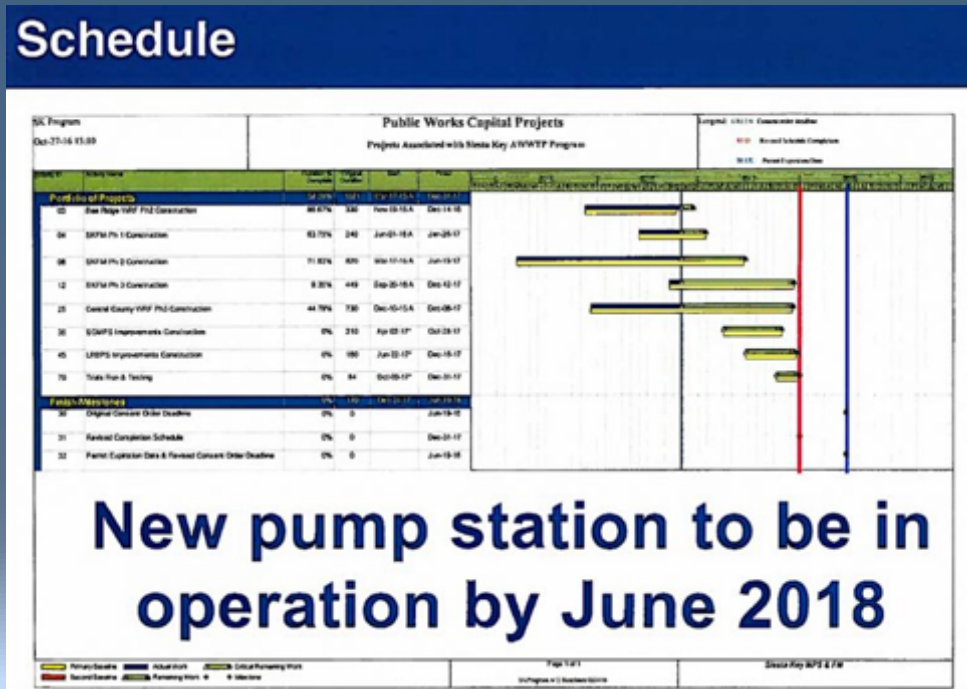
SCHEDULING

- Maintain Schedule - Owner decisions during design, bidding, construction, startup - Timely input is critical.
- Total project schedule-not just construction.
- Simple schedule or detailed?
- Tell the Owner what he needs to review promptly -



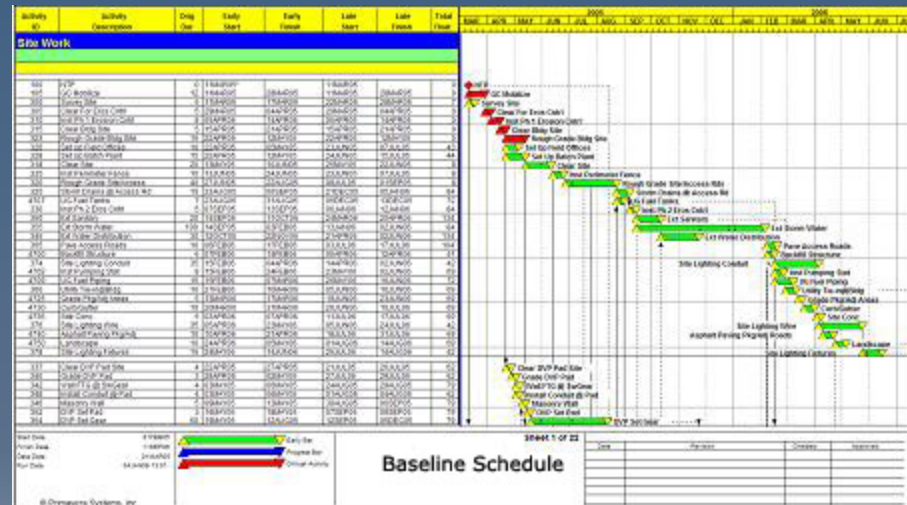
SCHEDULING

- Total project schedule—not just construction.
- Realistic? Be careful



TOTAL PROJECT SCHEDULE

- Assist the Owner in really understanding the total schedule
- Bar chart, or Critical Path Diagram or Pretty Picture?
- What does it mean?
- “Negative Total Float”
- Is it realistic?



TOTAL PROJECT SCHEDULE

- Understand the Schedule
- Change Management—Time adjustments
- Contractor position - Reasonable or biased?

Middleborough WPCF		1																																		
Activity ID	Activity Name	OD	RD	Early Start	Early Finish	Late Start	Late Finish	TF	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	
Middleborough WPCF		636	422	30-Mar-15 A	20-Sep-17	11-Jan-16	31-Aug-17	-13	20-Sep-17, Milestones / Key Events																											
Milestones / Key Events		581	422	01-Jun-15 A	20-Sep-17	11-Jan-16	31-Aug-17	-13	20-Sep-17, Milestones / Key Events																											
14640	Construction Performance Period (NTP-27 months / 823 CDs - 8/31/17)	823	601	01-Jun-15 A	20-Sep-17	11-Jan-16	31-Aug-17	-20	Construction Performance Period																											
6450	Weather Tight - Phase New Tertiary Building	0	0		23-Feb-16		03-Feb-16	-14	Weather Tight - Phase New Tertiary Building																											
6840	Phase 1 Tertiary System - On Line	0	0		06-Jul-16		26-Aug-16	37	Phase 1 Tertiary System - On Line																											
7110	Weather Tight - Phase 1 Control Building	0	0		15-Jul-16		05-Apr-17	264	Weather Tight - Phase 1 Control Building																											
7960	Phase 2 Maintenance Garage Weather Tight	0	0		24-Aug-16		04-Aug-16	-14	Phase 2 Maintenance Garage Weather Tight																											
9910	Permanent Power "on line"	0	0		27-Oct-16		07-Oct-16	-14	Permanent Power "on line"																											
12000	Septage Holding Tank Mods - Complete	0	0		17-Nov-16		01-Jun-17	138	Septage Holding Tank Mods - Complete																											
11320	Primary Clarifier No.1 Mechanism Replacement - Complete	0	0		25-Nov-16		04-Nov-16	-14	Primary Clarifier No.1 Mechanism Replacement																											
11870	Post Chlorination Mods - Complete	0	0		25-Nov-16		01-Jun-17	133	Post Chlorination Mods - Complete																											
9740	Phase 4 Aeration Tank 2 - Complete	0	0		25-Nov-16		21-Mar-17	82	Phase 4 Aeration Tank 2 - Complete																											
10290	Phase 5 Aeration Tank - Complete	0	0		25-Nov-16		01-Jun-17	133	Phase 5 Aeration Tank - Complete																											
11170	Supplemental Carbon System - Complete	0	0		25-Nov-16		01-Jun-17	133	Supplemental Carbon System - Complete																											
8230	Phase 2 Maintenance Garage - Complete	0	0		28-Nov-16		27-Dec-16	21	Phase 2 Maintenance Garage - Complete																											
8670	Phase 3 Pretreatment System Complete	0	0		18-Jan-17		26-Jan-17	6	Phase 3 Pretreatment System Complete																											
7351	Phase 1 Sludge Pumping System - Complete	0	0		26-Jan-17		01-Jun-17	89	Phase 1 Sludge Pumping System - Complete																											
11470	Primary Clarifier No.2 Mechanism Replacement - Complete	0	0		02-Feb-17		13-Jan-17	-14	Primary Clarifier No.2 Mechanism Replacement																											
9880	Phase 4 Leachate Pumping System	0	0		06-Feb-17		01-Jun-17	82	Phase 4 Leachate Pumping System																											
9360	Phase Dewatering Screw Press No.1 - Complete	0	0		14-Feb-17		14-Feb-17	0	Phase Dewatering Screw Press No.1 - Complete																											
11620	Primary Clarifier No.1 Mechanism Replacement - Complete	0	0		12-Apr-17		23-Mar-17	-14	Primary Clarifier No.1 Mechanism Replacement																											
9170	Phase 1 Sludge Holding Tank Complete	0	0		25-Apr-17		03-May-17	6	Phase 1 Sludge Holding Tank Complete																											
10070	Phase Dewatering Screw Press No.2 - Complete	0	0		01-Jun-17		01-Jun-17	0	Phase Dewatering Screw Press No.2 - Complete																											
14050	Substantial Completion (FNLT 8/1/17)	0	0		21-Jun-17*		01-Jun-17	-20	Substantial Completion (FNLT 8/1/17)																											
11770	Secondary Clarifier No.2 Mechanism Replacement - Complete	0	0		21-Jun-17		01-Jun-17	-14	Secondary Clarifier No.2 Mechanism Replacement																											
14030	Final Completion (FNLT 8/31/17)	0	0		20-Sep-17		31-Aug-17	-20	Final Completion (FNLT 8/31/17)																											
Change Management		130	47	28-Sep-15 A	04-Apr-16	12-Feb-16	15-Mar-16	-14	04-Apr-16, Change Management																											
EPA/DEP Sand Filter & Tertiary Treatment Issue		130	47	28-Sep-15 A	04-Apr-16	12-Feb-16	15-Mar-16	-14	04-Apr-16, EPA / DEP Sand Filter's Tertiary Treatment Issue																											
D520	G/C & A/E negotiate cost	5	4	28-Sep-15 A	03-Feb-16	12-Feb-16	17-Feb-16	10	G/C & A/E negotiate cost																											
D530	A/E Issue change order	5	5	04-Feb-16	10-Feb-16	18-Feb-16	24-Feb-16	10	A/E Issue change order																											
D550	Disconnect Primaries at Storage Building	1	1	11-Feb-16	11-Feb-16	25-Feb-16	25-Feb-16	10	Disconnect Primaries at Storage Building																											
D560	Remove Existing Pad Mount Transformer	2	2	12-Feb-16	15-Feb-16	26-Feb-16	29-Feb-16	10	Remove Existing Pad Mount Transformer																											
D570	Construct Temporary Ductbank	5	5	16-Feb-16	22-Feb-16	01-Mar-16	07-Mar-16	10	Construct Temporary Ductbank																											
D580	Set New Transformer	2	2	23-Feb-16	24-Feb-16	08-Mar-16	09-Mar-16	10	Set New Transformer																											
D590	Pull Feeders to MCC No.4	2	2	30-Mar-16	31-Mar-16	10-Mar-16	11-Mar-16	-14	Pull Feeders to MCC No.4																											
D670	Terminate Pad Mount Transformer & MCC No.4	1	1	01-Apr-16	01-Apr-16	14-Mar-16	14-Mar-16	-14	Terminate Pad Mount Transformer & MCC No.4																											
D680	Energize Temporary Electrical Service	1	1	04-Apr-16	04-Apr-16	15-Mar-16	15-Mar-16	-14	Energize Temporary Electrical Service																											

CONSTRUCTABILITY REVIEW

- How can the project be built? Is phasing necessary or desirable?
- Reality check on drawings
- Do the plans and specs adequately address construction sequencing and all the intermediate stages?
- Are there long lead items?
- Should you procure major equipment separately?
- Traffic control, noise, dust, security,
- Coordination with other Town/City/Ag departments



CONSTRUCTION PHASE ROLE

- Prequalification of general contractors and subcontractors (filed sub-bids in MA)
- Review of Bids, Recommend Award
- Provide independent construction oversight – Resident Engineer and Construction Admin phase
- Change order Assessment
 - Evaluate their merits.
 - What caused the change?
 - Design oversight, Contractor greed, or legitimate change?



CONSTRUCTION PHASE ROLE MOPO

- Note on Drg: “Maintain pipeline/pump station/WWTF in operation during construction”
- Maintenance of Plant Operation (MOPO) - Formal MOPO plan in Specs
- Run through with Owner before bidding
 - Exercise valve, gates
 - Process limits: Capacity of each process -1
 - SCADA changeout.
 - Mechanical Pinch points
 - Wet weather



CHANGE MANAGEMENT

- Owner Expectations – Perfect design?
- Change Orders: 2-5-10%??
- Reality: Causes:
 - Drawing Error or Omission
 - Design Changes
 - Specifications Conflict v Drawings
 - Substitutions by Contractor
 - Unforeseen Conditions:
 - Groundwater higher than expected
 - Rock, different soils; soil contamination
 - Rehab of existing plant/buildings – old walls, roof, wiring, Lead-PCBs-asbestos



START-UP/COMMISSIONING

- Frequently Rushed – little \$ remaining,
- Coordinate the pump station, plant & building commissioning, startup and testing phases
- Equipment Testing/Vendor Training
- O&M Manuals
- Accurate Record Drawings
- SCADA & Controls – Local, Remote,



START-UP/COMMISSIONING (CONT'D)

- Multiple Steps: Checkout- Testing-Startup
- Training
- Staff training – often rushed at the end of a project as budget and schedule pressures escalate.
- Building commissioning - HVAC



"CLOSEOUT"

- Substantial Completion, Final Completion
- Reduce Retainage from 5% to 3-2-1%
- Final Payment, Lien Releases
- Record Drawings
- O&M Manuals
- Warranties
- Hand it over to the Owner



OPM FEE CONSIDERATIONS

- Varies by project complexity, Owner expectations.
- Reasonable Ranges as % of Construction:
 - OPM Fee: 2-5% +_
 - Designer Fee: 7-12%
 - Construction Phase Services: 7-10%
- Commissioning: 1/2 to 1%
- Conclusion: OPM Fee is modest and adds value.



VALUE ADDED

- Cannot rely 100% on the Designer
- Conflicts will arise between the Owner, Designer and Contractor.
- Who is truly independent?
- Need a second set of independent eyes.
- OPM brings Value —fewer/smaller claims, change orders, better quality end product.
- Transparency



OPM ROLE WRAP-UP

- Team work - take a lead role
- Protect the Owner but still work cooperatively with Designer and Contractor
- Remain independent; provide input on what changes occur during design and construction
- Drive realistic project budget and schedule
- Establish fair price and schedule adjustments when they arise.
- Keep everyone accountable, including the Owner at times!



CONCLUSION: ROLE AND VALUE

- Role & Value are tangible. Accountability & Transparency
- Role – Watch the Owner's Back;
- Maintain Accountability of Designer and Contractor
- Value....Transparency, Cost and Schedule, Change Management, Document Control
- Applicable to:
 - All Wastewater Facility, Pump station projects
 - More Complex Utility/Pipeline projects

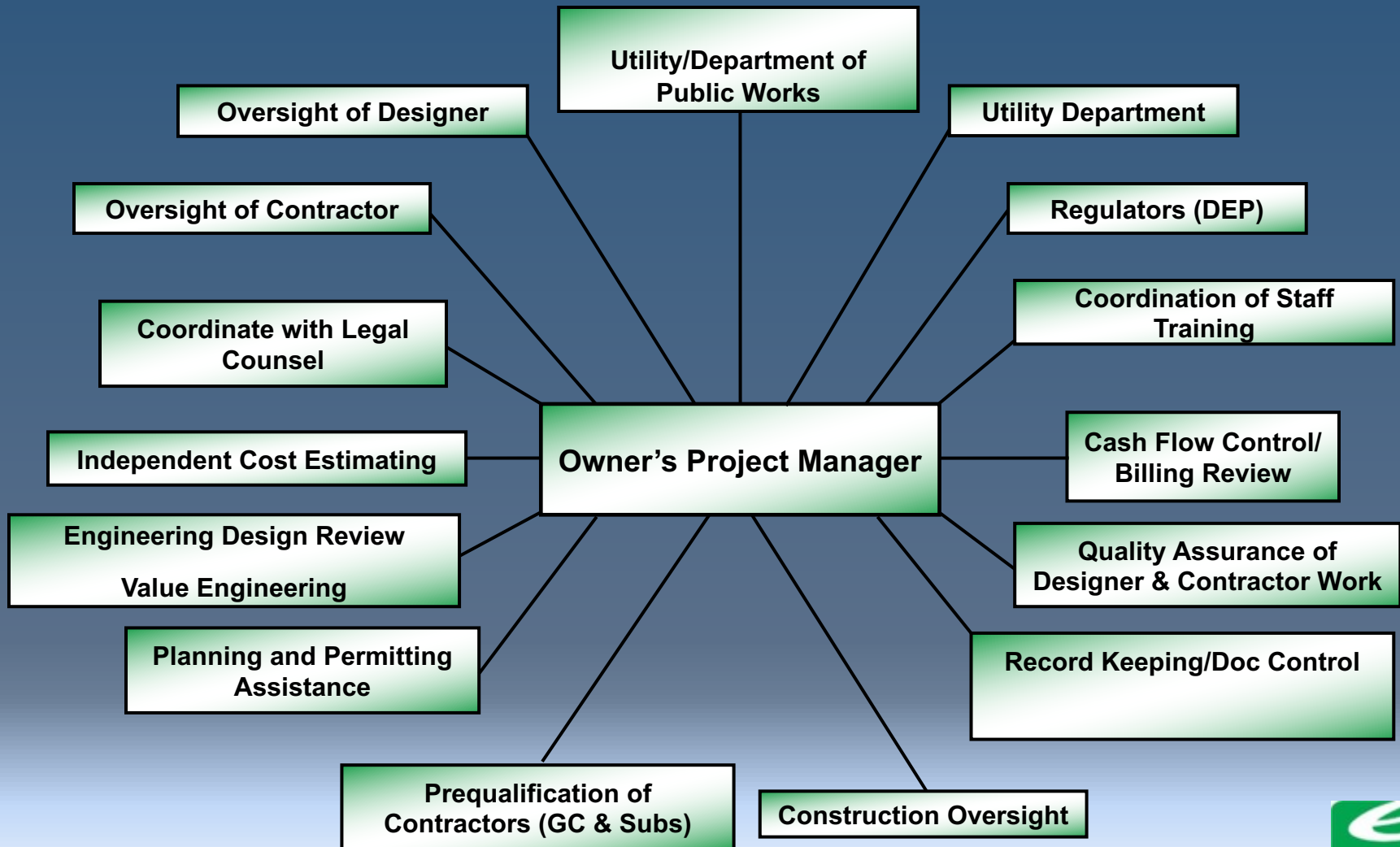


APPLICABILITY

- Applicable to:
 - All Wastewater Facility projects
 - Most Pump station projects, Building
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ROLE AND VALUE OF OPM



QUESTIONS?

