



BSB51415 Diploma of Project Management



Constraint Management

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Version control & document history

Date	Summary of modifications made	Version
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22 June 2017	Updated Table of Contents	1.1
18 October 2018	Change to Practical Assessment	1.11

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ASSESSMENT WORKBOOK COVERSHEET

WORKBOOK:	Workbook 2
TITLE:	Constraint Management
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Please read the Candidate Declaration below and if you agree to the terms of the declaration sign and date in the space provided.

By submitting this work, I declare that:

- I have been advised of the assessment requirements, have been made aware of my rights and responsibilities as an assessment candidate, and choose to be assessed at this time.
- I am aware that there is a limit to the number of submissions that I can make for each assessment and I am submitting all documents required to complete this Assessment Workbook.
- I have organised and named the files I am submitting according to the instructions provided and I am aware that my assessor will not assess work that cannot be clearly identified and may request the work be resubmitted according to the correct process.
- This work is my own and contains no material written by another person except where due reference is made. I am aware that a false declaration may lead to the withdrawal of a qualification or statement of attainment.
- I am aware that there is a policy of checking the validity of qualifications that I submit as evidence as well as the qualifications/evidence of parties who verify my performance or observable skills. I give my consent to contact these parties for verification purposes.

		Date:
Name :	Craig Silva	Signature:
		25/04/2020

WRITTEN QUESTIONS

Part 1 – Project Scope

1. Which of the following are project initiation documentation required at the start of the project?

Select all that apply.

	a. Communications log
X	b. Project plan
	c. Work Breakdown Structure (WBS)
	d. Gantt Chart
X	e. Project charter
	f. Risk management

2. Which of the following are components of a project scope-management plan?

Select all that apply.

X	a. Project deliverables
	b. Project staff assignments
	c. Change request
X	d. Project justification
X	e. Product description
	f. Performance reports
X	g. Project objectives
	h. Project funding requirements
	i. Quality metrics
	j. Budget forecasts

6. The following are methods of measuring work outcomes and progress against plans. Match each method to its correct description.

Write the letters that correspond to your answers in the spaces provided.

	Method	Description
C	Units completed	a. Also known as the 'steps' method, this is used for projects that involve subtasks that need to be completed in an orderly fashion.
A	Incremental milestones	b. In this method, tasks that are being calculated tend to occur over a longer duration time and include multiple subtasks, where subtasks can have different units of measurements.
D	Start / finish	c. This method is used when project tasks are done repeatedly. Assuming that each task is completed at the same amount of time, resources and effort, each task is counted and totaled.
B	Weighted or equivalent units	d. This method is used to determine the percentage of the work completed and the percentage of the work that is still yet to be completed.

- Using phases of project lifecycle as first level of decomposition, product and deliverables inserted at the second level.
- Major deliverables at first level of decomposition
- Subprojects developed outside the project team such as contracted work.

9. The following are some problem areas in scope management. In your own words, briefly discuss each problem area.

Do not exceed 100 words for each discussion.

Problem areas	Discussion
Scope creep	Scope creep comes from a projects requirements increasing over the project lifecycle. It may be caused by project sponsors or stakeholders changing requirements. It can also come when a projects scope is not clearly defined, documented or controlled. Scope creep is best managed by having a comprehensive list of inclusion and exclusions as well as a solid change management process.
Sponsor / project owner approval	Sponsor or owner approval can be a problem to scope as they may deem items or tasks to take shorter or longer than estimated.
Project team accountability	Project team need to be accountable as they may be falling behind on a task or not delivering what has been agreed to in the scope of the project. This can cause major time and cost problems to the project and is why other parts of the team have to keep monitoring the project.

10. In your own words, discuss the significance of scope management.

Do not exceed 150 words.

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Do not exceed 150 words.

Scope management is significant as it ensures project team members understand the scope and how the project goals are to met. It aids to avoid the problems and challenges that may come from growing scope or changing requirement list. Scope management takes control of factors that may result in changes during the project lifecycle. Controlling what gets added or removed during the project.

Without a scope a projects time or cost cannot be estimated. Scopes may need to change but if not communicated well can lead to extra costs and may add time on to the project.

In managing the scope it is first important to determine and plan. This helps to keep the project on course. With a clear scope any changes that are made by the project owner can be easily negotiated.

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11. The *PMBOK Guide* outlines the following processes in project scope management. List one (1) tool or technique used in each process.

Project Scope Management	Tool or technique
Collect requirements	Interviews
Define scope	Product analysis
Create WBS	Decomposition
Verify scope	Inspection
Control scope	Variance analysis

Part 2 – Project Time

1. The following are estimation tools and techniques used in determining duration. Match each tool and technique to its correct description.

Write the letters that correspond to your answers in the spaces provided.

	Estimation tools and techniques	Description
B	Analogous estimating	a. This technique uses a statistical relationship between historical data and other variables to calculate an estimate for activity duration.
A	Parametric estimating	b. This uses parameters such as duration, budget size, weight, and complexity, from a previous, similar project, as the basis for estimating the same parameter to measure for a future project. This technique relies on the actual duration of previous, similar projects as the basis for estimating the duration of the current project.
E	Three-point estimating	c. This is guided by historical information. It provides duration estimate information or recommended maximum activity durations from prior similar projects. This can also be used to determine whether to combine methods of estimating and how to reconcile differences between them.
C	Expert judgement estimating	d. Contingencies are accounted for into the overall project schedule to account for schedule uncertainties.
D	Reserve analysis	e. This technique uses a mathematical formula to determine a weighted average of estimates. It uses the formula: $Te = \frac{To + 4 \times Tm + Tp}{6}$.

2. The following are estimation tools techniques used in determining activity resource. Match each to its correct description.

Write the letters that correspond to your answers in the spaces provided.

	Estimation tools and techniques	Description
D	Expert judgment	a. Several companies or organisations routinely distribute updated production rates and unit costs of resources for an extensive array of labour trades, material, and equipment for different countries and geographical locations within countries.
E	Alternative analysis	b. In this technique, when an activity cannot be estimated with a reasonable degree of confidence, the work within the activity is decomposed into more detail. The resource needs are estimated. These estimates are then aggregated into a total quantity for each of the activity's resources.
A	Published estimating data	c. This tool has the capability to help plan, organise, and manage resource pools and develop resource estimates.
B	Bottom-Up estimating	d. This technique is often required to assess the resource-related inputs to this process. Any group or person specialised with knowledge in resource planning and estimating can provide such expertise.
C	Project management software	e. These include using various levels of resource capability or skills, different, size or type of machines, different tools (hand versus automated), and make-or-buy regarding the resource.

4. Which of the following statements accurately explain the process of developing the project schedule, including the schedule baseline?

Select all that apply.

X	a. Developing the schedule is the process of analysing activity sequences, durations, resource, requirements, and schedule constraints to create the project schedule.
X	b. The project schedule and schedule baseline are developed or established using the activity lists, activity attributes, project scope statement as the bases.
X	c. Entering the activities, durations, and resources into the scheduling tool generates the schedule baseline.
	d. Tools and techniques used in developing the project schedule and schedule baseline include decomposition of the total project work.
	e. Developing the schedule baseline starts and ends in the planning phase of the project.

5. Schedule control is the process of monitoring the status of the project to update project progress and manage changes to the schedule baseline.

Which of the following are processes that are involved in schedule control?

Select all that apply.

X	a. Determining the current status of the project schedule.
	b. Defining activities or specific actions to be performed to produce project deliverables
X	c. Influencing the factors that create schedule changes
	d. Decomposing total project work into its lowest levels.
X	e. Determining that the project schedule has changed
	f. Estimating duration and resource effort for the project.
X	g. Managing the actual changes as they occur.

8. The following are tools and techniques used in project scheduling. Match each tool and technique to its correct description.

Write the letters that correspond to your answers in the spaces provided.

	Project scheduling tools and techniques	Description
B	Schedule network analysis	a. This is the process of looking at all of the activities that must be completed, and calculating the 'best line' – or critical path – to take so that you'll complete the project in the minimum amount of time. The method calculates the earliest and latest possible start and finish times for project activities, and it estimates the dependencies among them to create a schedule of critical activities and dates.
A	Critical Path Analysis	b. This is a graphic representation of the project's activities, the time it takes to complete them, and the sequence in which they must be done. Project management software is typically used to create these analyses. Common formats for this include Gantt Charts and PERT Charts
D	Schedule compression	c. They expedite the scheduling process by generating start and finish dates based on the inputs of activities, network diagrams, resources, and activity durations.
C	Automated scheduling tools	d. This tool helps shorten the total duration of a project by decreasing the time allotted for certain activities. It's done so that you can meet time constraints, and still keep the original scope of the project.

9. Which of the following statements accurately explain the work breakdown structure (WBS) including its application in project schedules?

Select all that apply.

X	a. Work breakdown structure (WBS) is the subdivision of project deliverables and project work into smaller, more manageable components.
	b. The work breakdown structure (WBS) identifies project personnel who are responsible for each project task.
X	c. Work breakdown structure (WBS) helps define activities of the project which provide the basis for estimating, scheduling, executing, and monitoring and controlling the project work.
	d. The work breakdown structure (WBS) is used to represent the full project scope of the project.
X	e. The work breakdown structure provides the relationships among all components of the project and the project deliverables.
X	f. The work breakdown structure (WBS) is used as the basis for the scope baseline which is used in identifying activities or specific actions to be performed to produce of the project deliverables.
	g. Project work at lowest levels are not included in the work breakdown structure (WBS)

1. The following are processes involved in project cost management including budgeting the cost of the project. In your own words, discuss each.
- Do not exceed fifty (50) words for each discussion.

Do not exceed fifty (50) words for each discussion.

Estimating costs	Estimating costs is the estimation of how much money will be required to complete the project. These are based on information that is known at the time and may include consideration of alternatives.
Determine budget	A budget is the breakdown of the estimated costs of the individual tasks. This then creates a cost baseline for the project.
Control cost	Controlling costs is monitoring the project so as to update the budget and manage any changes. This also involves recording actual costs spent to date.

2. The following are different tools and techniques used in cost management. Match each to its correct description.

Write the letters that correspond in the spaces provided.

	Strategy	Description
B	Analogous estimating	a. This is used to establish both the contingency reserves and the management reserves for the project with regards to cost.
C	Parametric estimating	b. This strategy uses the values of costings from a previous, similar project as the basis for estimating the same parameter or measure for a current project. This is used when the current project is similar to a previous one in terms of defined parameters.
E	Cost aggregation	c. This uses a statistical relationship between historical data and other variables to calculate and estimate for cost. This technique is used to produce higher levels of accuracy depending upon the sophistication and underlying data built into the model. Estimates made through this project can be applied to the whole project or to segments of a project.
A	Reserve analysis	d. These are used to develop mathematical models to predict total project costs.
D	Historical relationships	e. Cost estimates are combined by work packages in accordance with the Work Breakdown Structure. The work package cost estimates are then combined for the higher component levels of the WBS and ultimately for the entire project.
G	Earned value management	f. In this technique cost performance measurements are used to assess the magnitude of variation to the original cost baseline.

F	Variance analysis	g. This is commonly used as a performance measurement. It integrates project scope, cost, and schedule measure to help the project management team assess and measure project performance and progress.
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3. List four (4) processes which are followed in monitoring the project costs against outcomes to ensure that additional expenses are not incurred.

- a. Use of a tool such as a spreadsheet or a financial management software package.
- b. Regular invoicing e.g. monthly.
- c. Prompt payment of invoices.
- d. Checking of invoices against contracts, quotes or agreements.

Part 4 – Project Quality

1. In your own words, discuss each of the following key concepts in Quality Management.

Do not exceed 100 words for each discussion.

Key Concepts in Quality Management	Discussion
Customer satisfaction	Customer satisfaction is vital for a project to be looked at as successful. While it is still important to ensure that the project is running well from your side of the project if the customer is not happy then may be deemed a failure. It is therefore important to make sure the customer gets what they have been told they will receive. This can be done by ensuring projects are well run and quality of all aspects of the project are maintained. Customer satisfaction can lead to further business and projects.
Prevention over inspection	This concept relates to looking at the money spent on projects to avoid failures or defects compared to cost of rectifying them. This may be an alternate item may have been used in order to try and save money but it does not end up meeting standards and will need to be replaced. Therefore the cost of rectifying the issue far outlays any savings that were made by using the alternate.
Continuous improvement	Constant improvement is looking at ways that products, services and processes can be improved. Improvements to these can come in different ways and sizes. By looking for constant improvement you can lessen or eliminate the costs for reworks due to poor products or works. Improvement can be taken advice from others that have learnt from previous experiences or projects.

2. In your own words, discuss the difference between Quality Assurance and Quality Control.

Do not exceed 100 words.

Quality assurance is to show that something meets all quality requirements required. To do this there are different processes and techniques such as review, training and facilitation. It is used to audit systems, materials and products that will be used on the project.

Quality control is monitoring of the installation of the above and to remove or rectify any defects.

3. The following are standards that could apply in various projects. In your own words, discuss each standard. Do not exceed fifty (50) words for each discussion.

People standards	People standards is to ensure that qualifications and experience are held by the people that are to do the job. Also to provide additional training, testing and development if required.
Process standards	The process standards are used to deliver the project. These involve quality assurance auditing to the correct processes and items are being used and that each part of the project comes together with the other.
Product / service standards	Product and service standards are formal standards that are in place. They need to be met and complied with in order for works or items to be approved.

Introduction

You have been appointed as a project management consultant to the project team at Awesome Landscapes Pty Ltd. Specifically, you are required to provide independent advice on seeing their current project throughout its entire lifecycle.

You have already provided advice to Awesome Landscapes in the previous workbook.

Today is 24 July 20xx. The project will shortly progress into the implementation stage. You have now been provided with up-to-date project documentation below, including an updated Project Plan. The project steering committee have reviewed the Project Plan, but they wish to have you conduct an independent evaluation of the project prior to signing it off.

As part of your consultancy services, you will be assisting the team in addressing issues around project constraints by answering the questions that follow this scenario.

The documents you need to complete the succeeding tasks can be accessed through the following links:

Project Charter version 2 (.pdf)

Project Plan version 2 (.pdf)

Project Gantt Chart version 2 (.mpp)

[Project Gantt Chart version 2 \(.pdf\)](#)

[Project Network Diagram version 2 \(.pdf\)](#)

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(username: cstclearner password: CstcPty@123)
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Note: These documents were generated in year 2016. For the purpose of this assessment, refer to ‘2016’ as the current year and ‘2017’ as the succeeding year.

1. List the three (3) project deliverables in Phase 1.

- a. Removal of vegetation.
- b. Construct access roads.
- c. Build retaining walls.

2. Discuss the project constraints in terms of scope, time, cost, and quality.

Scope	Three deliverables - Pre Building, Building Support and Planting and Landscaping.
Time	Change of project start 27 July 2016 with completion due 11th March 2017.
Cost	Cost now stands at \$462,153
Quality	Cascade Peak Shire Council, General Building Regulations, Cascade Peak Shire Council Regulations.

3. Review the project schedule as set out in the Project Plan and the Gantt Chart Arrange the following tasks in the proper sequence as dictated in Phase 3 of the critical path.

Write 1 – 12 in the spaces provided; where 1 go first and 12 go last.

8	Remove weeds
11	Plant additional plants
2	Move gravel to car park
1	Expand car park
12	Remove greenhouses
9	Plant plants from greenhouses
3	Seal car park
6	Soil preparation
7	Add boulders
5	Construct stone paving pathway

10	Purchase additional plants
4	Landscape over old access roads

The costs on the financial tables display other costs that are either directly or not directly associated with the three new retaining walls. All costs for the extra retaining walls total \$17,900.00 and this figure should have probably should have been listed on the updated project plan version table.

6. Who is responsible for working out these impacts of what initially seemed to be such a simple change, and ensuring all affected stakeholders understand the impact of such a change?

Sam Ng the project manager for Awesome Landscapes is responsible for all affected stakeholders understand the impact of the changes that adding three extra retaining walls has done. He can do this through an updated Project Plan that displays all scope, time, cost and quality changes.

7. Access and review the Gantt Chart version 2.
 - a. What important tasks are not included in the project Gantt Chart?
 - b. Discuss why these tasks must be included in the Gantt Chart? Keep your discussion within 100 – 200 words in length.

- a. The construction of the three extra retaining walls is not included in version 2 of the Gantt chart. This involves the three tasks of delivery of boulders, construction of walls and compaction of soil behind walls.
- b. It is crucial to include these tasks to the updated version of the Gantt chart. With approval of the construction of an extra three retaining walls the project was given an earlier start date to compensate for the extra time required to construct. However the three tasks it takes to build these walls have been given no extra duration when compared to version 1 Gantt chart. By not giving extra duration time to these tasks may put the project in jeopardy as if the walls aren't complete in the nominated time period the rest of the project time frames will start pushing out. Also by not including in the latest version other contractors will be expecting and basing their programs around what is in the latest version.

8. List the three (3) personnel who signed off on the change request.

- a. Susan Wills (Program Manager - Massive Eco Developments)
- b. Stephen Lyons (Planning Manager - Cascade Peak Shire Council)
- c. Kim Nguyen (Director - Awsome Landscapes)

- Access and review the Gantt Chart version 2. It shows double bars for each task.

- What do the coloured bars represent?
- What do the grey bars represent?
- Why do the grey and coloured bars do not match up in the Gantt chart?

- Coloured bars represent job tasks.
- The grey bars represent task summary.
- The grey bars are a summary of a task, they show the full duration of the stage of the project. The coloured bars are for the individual tasks that make up the stage. They are of shorter duration and therefore don't match up.

13. Assuming the project runs on schedule, list two (2) tasks that should be in progress if Sam was to visit the site on Monday 22 August.

Do not include the task ‘Project Management’.

- Delivery of granite boulders.
- Moving plants to greenhouse.

16. What is the total budget for the project expenditure?

The total budget for project expenditure currently stands at \$462,153.00

17. Sam is very concerned about the cash flow of the project.
 - a. What is the problem?
 - b. What would you suggest be done to rectify the cash flow issue?

b. What would you suggest be done to rectify the cash flow issue?

- a. Sam may be concerned about the negative cash flow for the first two months of the project.
- b. In Project Plan Version 2 - 4.5 Source of Funds. It states payment 1 that is 50% of contract value will be paid at the commencement of Stage1. However the payment schedule in this clause has expected payment date being the 1st October 2016. Cash flow can be rectified by having the sponsor agree to pay as stated at the commencement of the project. Another way to improve cash flow would be to have monthly progress claims to Massive Eco-Developments instead of having to wait for stage completions.

b. In Project Plan Version 2 - 4.5 Source of Funds. It states payment 1 that is 50% of contract value will be paid at the commencement of Stage1. However the payment schedule in this clause has expected payment date being the 1st October 2016. Cash flow can be rectified by having the sponsor agree to pay as stated at the commencement of the project. Another way to improve cash flow would be to have monthly progress claims to Massive Eco-Developments instead of having to wait for stage completions.

19. Complete the following Audit Template with the standards determined in the previous question (Case Study Question 18). This will be given to an internal auditor to audit the financial processes at various points along the project.

Guidance: Complete only the fields highlighted in yellow. Do not complete the 'Assessment' and 'Comment' fields under 'Audit of Management of Project'.

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Quality Audit Template		
Project Name: <i>Cascade Peak Chalets Landscaping Project</i>		
Prepared by: Sam Ng		
Date:		
Project Manager: <i>Sam Ng, Awesome Landscapes</i>		
Project Phase:	Overall Project Status:	
Audit Date:	Audit Number:	Audit Leader:
Audit Team:		
Goal(s) of This Specific Audit: Project Financial Processes		
Audit of Management of Project:		
1. Change Request 1 has total cost of \$17900	Assessment:	Comment:
2. As per clause 4.4 can Awesome Landscaping ask for more funding.	Assessment:	Comment:
3. As per clause 4.5 can Awesome Landscaping ask for more funding.	Assessment:	Comment:

20. Sam has provided you with the following audit from a previous project (landscaping the new Cascade Peak Shopping Centre). Evaluate the audit report below and answer the following questions:
- What was the cause of the unsatisfactory results?
 - What action would you recommend to prevent the issue coming up again in this project?

- The cause of unsatisfactory results was poor communication. There was not enough information communicated to the site supervisor for the requirements for each task and this then led to poor communication to team members and contractors.
- A recommendation would be to have the Project Manager prepare the individual tasks briefs with a better level of detail and supply them with relevant attachments and plans.

Quality Audit Template		
Project Name: <i>Cascade Peak Chalets Landscaping Project</i>		
Prepared by: <i>Sam Ng</i>		
Date: <i>17 August 2015</i>		
Project Manager: <i>Sam Ng, Awesome Landscapes</i>		
Project Phase: <i>Implementation</i>	Overall Project Status: <i>On schedule</i>	
Audit Date: <i>17 August 2011</i>	Audit Number: <i>26</i>	Audit Leader: <i>Sam Ng</i>
Audit Team: <i>Sam Ng, John Cowley, Ann Deak.</i>		
Goal(s) of This Specific Audit: <i>To evaluate the communication and reporting processes.</i>		
Audit of Management of Project:		

Have you attached additional material(s)?		yes	x	n	o
Audit Report Submitted To: Kim Nguyen	Date: 24/08/2015				

4. COST MANAGEMENT PLAN

4.1 Contractual Requirements.

Contract is a fixed sum contract of \$550,000.00. Total budget on commencement is \$444,253.00 with a contingency of \$105,747.00. This contingency is to cover any project extensions, variations scope or increases in the cost of labour, procurement or purchases.

Auditing will take place middle of each month using Appendix 36.

A performance report will completed after any change request using Appendix 39. An updated project plan will then be provided showing any budget changes in Appendix 6 - Summary Costing per Phase, Appendix 7 - Detailed Costing per Task and Appendix 8 - Project Cashflow.

4.2 Invoicing.

As per contracts with Contractors and suppliers payments will be made in the final week of each Stage of the project in which they are performing tasks.

Payment will be made immediately upon approved completion of the stage.

	24/09/2016	01/07/2017	11/03/2017
J P Digging Pty Ltd.	\$26,950	\$32,000	\$36,900
Earthmoving Logistics Pty Ltd.	\$148,180.	\$0	\$2,500

As per contract with Massive Eco-Development Corporation, Awesome Landscaping raise an invoice on the first working day of the month following the due date of each progress payment.

For out going invoicing and payment amounts and dates please refer to Blue Table below.

4.3 Reporting.

As per contractual requirements internal cost auditing will be completed in the middle of each month of the project. They are to completed and submitted by the 15th day of each month.

As per contractual requirements of the project using Appendix 39 a Performance report will be completed for any change requests.

4.4 Contingency.

There is a contingency of \$105,747 to absorb any extra costs that the project may occur. There are no additional contingency funds for this project.

Any use of contingency monies must be formally approved and signed off by the steering committee. All approved use will then be entered into Appendix 37 - Change Register.

Two columns need to added to Change Register.

* \$ Value of Change Request.

* \$ Amount of Contingency Remaining.

4.5 Progress Payments

As per contract between Awesome Landscaping and Massive Eco-Development a sum of \$550,000 + GST will be paid for all landscaping work done on the project. This is a fixed price contract therefore there will no change regardless of any variations in scope, project extensions or increases in cost of labour, procurement or purchases.

	Invoice Date	Invoice %	Invoice Amount	Payment Due
Project Commencement	01/08/2016	50%	\$275,000 + GST	28/08/2016
Stage 1 Completion	01/10/2016	20%	\$110,000 + GST	29/10/2016
Stage 2 Completion	01/02/2017	20%	\$110,000 + GST	28/02/2017
Stage 3 Completion	09/03/2017	10%	\$55,000 + GST	29/04/2017

4.6 Actual/Projected Cash Flow.

	Expenses	Progress Payments	Cumulative Expenses	Projected Cashflow
Stage 1	\$247,768	\$275,000	\$247,768	\$27,232
Stage 2	\$71,891	\$110,000	\$319,659	\$65,341
Stage 3	\$142,494	\$110,000	\$462,153	\$32,847
Completion	-	\$55,000	-	\$87,847

