THE VALUE MANAGEMENT WORKBOOK: A STANDARD APPROACH FOR PROJECT MANAGERS

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ABSTRACT

This paper describes the development, application and benefits to be gained from the formal application of a designed for purpose, Value Management Workbook. While this paper only deals with construction projects and the project manager, it will demonstrate the validity of the approach in both manufacturing and management projects.

INTRODUCTION

One of the key elements of Value Management [VM] is fact that it is a "systematic approach to problem identification and problem solving". How many value management practitioners see this statement as restricting them solely to the VM Job Plan. To my way of thinking, the whole approach is systematic. From the very first discussion one has with a prospective client to the final stages of the implementation of the VM teams recommendations, it has been a systematic experience.

VM does not have the exclusive rights tosystematic problem solving, as the ancient Greeks were masters of this approach to problem solving, and more recently, some 500 years ago Hindu Priests were practicing this management skill. Even more recently [to name a few] we had the Scientific Method [Bacon. 17th. century], Work Study Methodology [Taylor. 19th. century] and the Value Analysis Job Plan [Larry Miles. 20th century]. We have always been quite comfortable with an organised approach to the way we think and act, and by our very acceptance of the way in which we seek to organise and direct others who enter into our sphere of control, albeit, even briefly.

Those of you who have read my papers on creativity and creative problem solving, are well aware that I am not espousing some philosophy of conforming to old habits or beliefs. What I am suggesting is that there are times when if one is to gain the maximum benefit from a situation, one may need to apply a systematic approach to the way in which one acts and takes control of events.

A excellent method of recording all phases of a study [pre, actual and post study activities] is to complete a VM Study Project Workbook. Such a document is a formal record of a study kept asa checklist from problem definition to final recommendations and implementation.

This method is most efficient, as the chance of important information or details being overlooked is almost non-existent. Also, all reports are produced and presented in the same format, thus facilitating a set of uniform statistical records being kept and updated over a long period of time. Actually, as far back as 1972 The PLESSEY Co. Ltd. produced a concise and practical Workbook for this very purpose.

WORKBOOK; CONCEPT

I believe before one even contemplates the format, it is essential to first identify and validate the unique functional requirements. It is essential that the Workbook when completed contains all of the information required.

I am sure that each and every one of us is capable of identifying a number of methods which will enable one to identify, validate and refine the information any such document must contain.

As with any formal approach of this nature there is certain information which is mandatory, with a degree of mental effort this information can be identified and agreed. It can be obtained from synthetic records and or data from previous VM studies. This is not only the most difficult method it is also the most likely to fail to meet the objective, viz. production of a unique check list to meet your stated functional user requirement. I start with an open mind, uncluttered by any external influences or pre-conceptions. My experience has shown [without exception], that Forced Comparisons is by far the quickest, easiest and most effective technique for this exercise.

FORCED COMPARISON TECHNIQUE

This technique has a certain uniqueness, for it is one of the few Creative Techniques which can be successfully carried-out as an individual or by a team.

The concept is based upon the premise that the mind is more efficient when it is required to concentrate upon specifics rather than generalities. It is very easy for the problem solver to become confused when dealing only in generalities, most of us have experienced a situation where we have been unable to come to grips with a problem, simply because of themanner in which it was presented to us, ie. in generic terms.

There is only one reason or justification for using this technique as a replacement for Check Listing [and that is exactly what a VM Workbook is], and that is; Forced Comparison is the only technique of this type which can guarantee to produce a check list which is unique to a specific requirement.

I have used this very approach with a number of my clients since 1989, in all instances it has been not only successful, but cost effective.

WORKBOOK; FORMAT

The actual format a VM Workbook should take, is entirely up to the individual or organisation. However, I firmly believe that it is essential for its contents to be kept concise and simple.

The Australian Army has an acronym, K.I.S.S. "Keep It Simple Stupid". One would do well to keep this in mind when designing this or any other document of this nature. Should the Workbook or any document be ambiguous or complicated to complete, people just will not do it. Therefore, the document becomes self defeating and a total waste of energy.

It is not possible to reproduce a complete Workbook in an article of this size. Therefore, I shall reproduce excerpts from selected pages and comment upon them.

It has been a deliberate action on my part not to reproduce information from previous VM studies. It is difficult enough to relate to a previous study, where the reader is only privy to a limited amount of information. What tends to happen is that they become confused, not by the information presented, but by their assumptions of what they believe was said or being proposed by the author. Further, the forms presented are self explanatory.

As I wish to present these worksheets in a format that can be easily read, I shall reproduce them as near to full size as possible. This will necessitate that they are included at the end of the paper and not, as is usual, in the text, for this I apologise.

WORKBOOK; CONTENT

This rests entirely on the Workbook, I have one for construction projects, another fordesign and development, which includes manufacturing processes and finally one for Strategic Management Projects, which deals exclusively with corporate planning and the establishment of management objectives in the form of, short, medium and long term goals. Rather than confuse the reader, I shall limit my comments to the construction projects Workbook, which actually has 42 pages. In fact there are only 21 pages of text [each page is a form designed to meet a specific requirement], as it is printed single sided to allow the user to record comments on the blank pages. The purpose being to encapsulate all of the vital information into a single document. It is absolutely essential the workbook has a complete and comprehensive index, you might know exactly where to find a gem of information, it is a sure bet other readers will not.

Today with the portable computer and Notebook, filling in forms and the erasing of errors no longer becomes a chore. One jots down the information as it comes to hand and then compiles and corrects the information at one's leisure. Furthermore, it is not necessary to issue the total workbook each time, only those pages which are relevant to the study/project and or the reader. A 3.5" disc is a very effective alternative to sending a rather bulky document through the mail.

The major components of this particular Workbook contain data which is relevant to the Project and all Phases of the VM Job Plan I use. viz. Information, Speculation, Evaluation, Development, Reporting and Implementation. It is at this point that the individual's approach will influence the actual contents of a Workbook.

WORKBOOK DEVELOPMENT

Without exception all of my clients who have taken this concept on board have used the same approach to develop their own unique VM Workbook. Using a small in-house team tasked to apply the Forced Comparison technique to produce, develop and validate the Workbook contents.

With the assistance of a person skilled in word processing and a reasonable knowledge of computer graphics, the whole exercise can be completed in a matter of a few days. The original team is only required on an ad hoc basis once the first session has been completed.

Once developed it was a relatively simplematter to gain formal management approval to introduce the workbook as a standard element of Project Management Documentation. Possibly the hardest exercise was that of selling it to Project Managers and their staff. Basically their responses could be categorised into two groups: those who complained bitterly, "why has it taken you ....!! so long to develop this", and could then not get their hands on the workbook quick enough. And the second group who wanted to alter and/or add to it. This latter group had to be restrained, for if let loose they might still be altering or adding to the contents and the Workbook would never have been released. Changes are inevitable to any document of this nature, however, they need to be controlled. Generally speaking I try to encourage and maintain a philosophy of, information out prior to information in.

One over zealous client asked me to review a Workbook I had developed some fifteen months before, because, as he put it "it seems to have grown like topsy and now makes the average encyclopedia look like a child's bedtime story". The problem had evolved simply because project officers were allowed to "add a page here and there to meet their special needs".

The problem was at first thought to be due to their unwillingness to conform to the concept of a Workbook, It turned out that the Workbook, its uses, application and benefits had not been fully explained to them. Now, what self respecting project officer is going to admit to anyone, leave alone their staff, that they do not understand formal company documentation?, a lesson well learned. Above all explain your Workbook to your staff and if necessary your contractors etc.

SPECIFIC DATA

While it is true to state that a high percentage of the contents are common to all of my workbooks, however, it is the remaining data which classifies that workbook into one of the three categories. Earlier I explained that my approach is to follow the VM Job Plan. My reasoning is bases upon the premise that one of the greatest advantages to be gained from using such a document is that it forces the project team to follow a systematic approach, by directing their actions in such a manner that they are focused on specifics and not allowed to wander off into the area of generalities. As an aide-memoire for the reader I am including an abbreviare of one of my VM Workbooks,see Figure 1.

VALUE MANAGEMENT WORKBOOK: INDEX:

SECTION #1 PROJECT DATA:	REFERENCE DOC:
VM STUDY TITLE, PROJECT TITLE	PDS #1
STUDY REFERENCE, PREPARED BY & DATE	
VM APPROVING AUTHORITY	
CLIENT DETAILS	
PROJECT COSTS & FISCAL REFERENCES	
VM STUDY COSTS: ESTIMATED/ACTUAL	
VM STUDY RETURN ON INVESTMENT	
VM STUDY TERMS OF REFERENCE	PDS #2
MAJOR STUDY ACTIVITIES	
PROJECT REFERENCES: CLIENT & D.& A.E.H.	
VM STUDY TEAM MEMBERSHIP DETAILS:	PDS #3
USER REQUIREMENT STATEMENT	PDS #4
& REFERENCES	
MAJOR STUDY CONTACTS	
COST CONSTRAINTS & REFERENCES	
ORIGINAL PROBLEM DEFINITION.	PDS #5
REDEFINED PROBLEM DEFINITION.	
STUDY AIMS & OBJECTIVES	
PREVIOUS STUDIES NON-VM & DATES	PDS #6
PREVIOUS VM STUDIES & DATES	
VM PILOT STUDY RESULTS	
PERCEIVED PROBLEMS	PDS #7
SPECIAL FUNCTIONAL REQUIREMENTS	
CURRENT CONTRACTORS &	
MAJOR CONSULTANTS	
STATUS VM PROJECT.	PDS #8
LIFE CYCLE COSTING DATA & FORMULA	
DESIGN TO COST DATA	
SPECIAL/UNUSUAL REQUIREMENTS	
AGREED HALF LIFE PERIOD	
APPROVING AUTHORITIES	
SECTION #2 INFORMATION PHASE DATA:	
VM STUDY PROJECT MANAGER DETAILS	INFO #1
PROJECT MANAGER'S 2IC DETAILS	
ad hoc STUDY CONTACTS	
REFERENCE DOCUMENTS & TITLES	INFO #2
PRIME CONTRACTORS	
PRIME CONTRACTOR DRWG	INFO #3
APPROVED ALTERNATIVE CONTRACTORS	
APPROVE ALT CONTRACTOR DRWG	
WHAT IS IT? & WHAT DOES IT DO?	INFO #4

WHAT MUST IT DO? & MAJOR SPECIFICATIONS
IS IT REALLY NECESSARY?

WHAT DOES IT COST: IE. ACTUAL [a.], INFO #5
ESTIMATED [e.], FUNDED [f.]
% OF TOTAL COST
BASIC FUNCTIONS & RELATED SPECIFICATIONS,
COST & % OF TOTAL COST

SECONDARY FUNCTIONS & RELATED INFO #6
SPECIFICATIONS, COST & % OF TOTAL COST
UNNECESSARY FUNCTIONS & RELATED
SPECIFICATIONS, COST & % OF TOTAL COST
TOTALS SHEETS INFO #5 & 6

BEFORE AND AFTER COSTS INFO #7
DIRECT ANALOGY SUMMARY
WHAT DOES THE CLIENT WISH
TO ACCOMPLISH?

MY LIST OF FACTS, ASSUMPTIONS & INFO #7
INFORMATION NEEDED BUT NOT KNOWN

LIST OF CONCERNS INFO #8

F.A.S.T. FORMAT SHEETS INFO #9/10

F.A.S.T. BLANK SHEET INFO #12

FUNCTIONAL ANALYSIS SHEET/MATRIX INFO #13

PARETO ANALYSIS BLANKS INFO #14/15

VALUE INDEX SUMMARY SHEET INFO #16

SECTION #3 SPECULATION PHASE DATA:

BRAINSTORMING EVALUATION SHEET SPEC #1/3

SYNECTICS: DIRECT ANALOGY FORMAT SPEC #4

SECTION #4 EVALUATION PHASE DATA:

FUNCTIONAL USER REQUIREMENTS: EVAL #1
WEIGHTING & RATING OF OPTIONS

FUNCTIONAL CRITERIA: EVAL #2
WEIGHTING & RATING OF OPTIONS MATRIX

OPTIONS REQUIRING FURTHER EVAL #3
EVALUATION & DEVELOPMENT SHEET
FOLLOW-UP ACTION PLAN DETAILS

SECTION #5 DEVELOPMENT PHASE DATA:

EXISTING DESIGN: SKETCH & DESCRIPTION DEV #1

OPTION# : SKETCH &DESCRIPTION DEV #2/3

SECTION #6 REPORTING PHASE DATA:

CONCLUSIONS & RECOMMENDATIONS: RPT #1
SAVINGS [a.] [e.] & [f.] & STATUS
RECOMMENDATIONS ACCEPTED FOR
IMPLEMENTATION OPPORTUNITIES FOR FURTHER
IMPROVEMENT & ACTION TO BE TAKEN

ESSENTIAL ELEMENTS/POINTS FOR INCLUSION RPT #2
IN THE FORMAL VM STUDY REPORT

ESSENTIAL ELEMENTS/POINTS TO BE INCLUDED RPT #3
IN THE FORMAL VM STUDY PRESENTATION

FORMAL VM STUDY PRESENTATION RPT #4
DETAILS & REQUIREMENTS

RECOMMENDATIONS ACCEPTED FOR RPT#5
IMPLEMENTATION ACHIEVABLE SAVINGS
& % OF TOTAL PROJECT COST
APPROVING AUTHORITY FOR CLIENT ACCEPTANCE
OF VM RECOMMENDATIONS
BREAK EVEN ANALYSIS DETAILS

SECTION #7 IMPLEMENTATION PHASE DATA:
ACTION LIST IMPL #1/2

AGREED MODIFICATION MATRIX IMPL #3

ACTIVITY/ACTION COST & SCHEDULE MATRIX IMPL #4

RECOMMENDED IMPLEMENTATION SCHEDULE IMPL #5

FIGURE 1

WORKSHEET EXAMPLES

Every Worksheet has an identical Header Block which includes an identification code and number, VM study title and reference number, date completed and by whom, etc. so that any page of the Workbook can be included in the body of a VM study report as a stand alone document. Examples 3. 4. and 5 do not show this Header Block as its inclusion would have prevented these figures from being reproduced two, to a page.

If one examines the Index [Figure 1] carefully, the information being sought can be quickly identified. Let us look briefly at Section #1 Project Data. I collect this information as a pre-study activity so that I can prepare the initial data pack for distribution once I have formed the VM study team. This activity usually requires only the involvement of the Client and Project Officer, and depending on the availability of the information is usually completed within 1-2 days. While all of the information is important, details regarding: Functional User Requirement Statement, Costing per se, the problem as perceived by the client, Previous Studies, Cost Constraints and the Life Cycle Costing are very helpful and certainly gives the VM Team Leader/Facilitator an edge on the team during the initial stages of the study.

Section #2 the Information Phase Data is possibly the most critical, and by the sheer volume most time consuming. As this information will become the very foundation for the study, I suppose one should not complain at the time required to collect, collate and extrapolate that which is required. The major benefit is that at this point of the study there is a team to assist with the task. As a guide for those providing and those seeking the information I suggest that they make the distinction between Fact and Point of View and record it in their notes as soon as possible. There are a few worksheets which I pay particular attention to, as the CVS and Team Leader, viz.

Info #4 & #5. for these produce answers to those very important questions: What is it? What does it do? What must it do? Is it really necessary ? and What does it cost? [this last question is broken up to show costs for the major components and/or functional areas, further, they are also shown as a percentage of the total cost.

Info #7. provides a complete Functional Cost break-up for Basic, Secondary and Unnecessary Functions for the before and after situations. Included in this matrix is the Specification Cost. All costs are identified as: Actual, Estimated and Funded and are shown as a percentage of the Total Cost.

One of the more important pieces of study information is recorded on this Worksheet and that is, What does the Client wish to accomplish for the VM study?

Info #8. this is My Worksheet. I have three headings: all begin "My List" and are Facts, Assumptions and Information Needed But Not Known. If you like this is a document which was designed to meet my individual requirements and not intended to be shared with either client or project officer, and certainly does not finish up in a VM study report. It allows me to express my own feelings and concerns regarding the project/study.

Info #16. This sheet is a means for summarisation of the Information Phase and the presenting of the Pilot Study findings to the client/sponsor as it contains detailed and quantitative data on the most important aspects of the VM study to this point. Further, it provides a realistic view of the way in which the study will progress and the possible outcome including an estimated Return On Investment.

Section #3 deals with the creative aspects of the study. While this is a very important phase, I believe in the majority of cases it is only necessary to record the ideas and the evaluation process followed and not details of the technique used. In this paper I have only referred to Brainstorming [I use the Gordon more than the Osborn approach] and Synectics, specifically the use of Direct Analogy.

Sections #4 and #5 again have been kept to a minimum for the purpose of this paper. It would be impractical for me to include all of the forms I use during these phases. Also, the forms produced for the Evaluation and Developmentphases are possibly the most flexible in their design as the information recorded can vary from study to study, this is particularly true when dealing with Graphs, Statistical Analysis, Whole Of Life Costing and the Weighting and Rating Matrix.

Section #6, as I use it, is basically an aide-memoire. The

report is in most cases, the last chance I shall have of convincing my client that the VM study findings should be accepted, supported and implemented. This being the case the last thing I want is for important details to have been omitted from the report, simply because the team forgot to include them. You might be able to overcome these omissions in an oral presentation, however, once the written report is in the "System" so to speak, it is completely out of your control and it is virtually impossible to retrieve it in order to insert the missing details.

Finally, Section #7, the importance of this phase is quite often overlooked. While implementation is usually a post-study activity the details regarding how it is to be achieved are an essential element of any VM study report. I went to a great deal of trouble to ensure that these worksheets were detailed enough without confusing the user or the client.

EXAMPLES

It should be noted that all four examples shown at the end of this paper have been severely truncated in order to fit them, two to a page.

Figure 2. [VMCOM #5] covers the problem definition as presented to the team by the Client and records its concurrence. It also formally records the Aims and Objectives, again as seen by the Client.

Figure 3. [VMCON #6] advises the team of any previous studies, and more importantly gives a summary of the findings.

Figure 4. [VMCON #12] records answers to four very important questions which must be asked as early as possible of any VM study.

Finally, Figure 5. [VMCON #13] details estimated costs for repairs from two separate sources: the Client and the Consulting Engineers. As you can see these costing can be shown as, Actual, Estimated or Funded.

These samples represent only a fraction of the Workbook contents, however, I believe they clearly demonstrate the value of the Workbook concept.

CONCLUSION

While, I have dealt with the Workbook concept, format, content, development, specific data and the index to my own Workbook in detail, I have deliberately not referred to specific projects or areas of application like manufacturing, management or construction, simply because this was not necessary. A major portion of the contents of any Workbook, or at least with only the slightest modification are applicable to any of the aforementioned projects.

My intention in writing and presenting this paper has always been to demonstrate that a well thought out and properly constructed Value Management Workbook is a most efficient and effective standard approach for Project Managers, particularly those who are required to ensure that a formal approach to VM is applied to their project.

It is important that it is clearly understood that the application of VM via the Workbook is unlimited and not solely for the use of project managers. Anyone who is charged with the responsibility for the conduct, or management of a formal approach to VM can gain considerable benefits from its systematic approach. I have a number of very satisfied clients who have been using the Workbook approach for the past five years.

REFERENCES

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3. Hannan D. "Value Management: A Project Workbook: Manufacturing" D. & A. E. Hannan & Associates Pty. Ltd. Canberra Australia. September 1989

4. Hannan D. "Value Management: A Project Workbook: Construction" D. & A. E. Hannan & Associates Pty. Ltd. Canberra Australia. September 1990

5. Hannan D. "Value Management: For The Project Manager" Proceedings Inaugural Conference, Australian Institute Of Project Management, Canberra Australia. October 1993.

D.&.A.E.H. VMCON #5 VM STUDY DATA SHEET #5

TITLE: DOUGLAS STATION CANOPY STRUCTURES	**.#** DAEH 37/93
PROJECT TITLE: RECTIFICATION OF CANOPY STRUCTURES ON	**PREP. BY:** D. HANNAN CVS
PLATFORMS # 1-8 AT DOUGLAS COUNTY STATION	**DATE:** 21 AUG. 1993

ORIGINAL PROBLEM DEFINITION:

SEVERE CRACKING WAS FOUND AT THE PARAMETER OF THE CONCRETE CANOPY ROOFS. ALSO, SEVERE RUSTING WAS FOUND IN THE ADJACENT STEEL FASCIAS AND IN THE SUPPORTING STRUCTURAL STEELWORK FOR THE CONCRETE ROOF SLABS. THE ROOF CANOPIES NO LONGER ARE SUFFICIENTLY WATERPROOF TO PROTECT INTERNAL REINFORCEMENT.

DATE & SOURCE OF THIS DEFINITION: INVESTIGATION OF ROOF CANOPIES & ASSOCIATED STEELWORK, DOUGLAS STATION. "MACROENG" CONSULTING ENGINEERS. REPORT DATED JUNE 1993

REDEFINED PROBLEM DEFINITION: DATE & SOURCE OF THIS DEFINITION: [NB. This Definition Must Be Agreed By All Parties]

AGREED BY VALUE MANAGEMENT TEAM THAT THE ORIGINAL DEFINITION SHOULD STAND. VM STUDY 21 AUGUST 1993

VM STUDY AIMS & OBJECTIVES:

AIMS: TO ENSURE THAT THE MOST COST EFFECTIVE AND PRACTICAL SOLUTION IS IDENTIFIED AND VALIDATED IN REGARD TO THE REFURBISHMENT/REPLACEMENT OF THE PLATFORM CANOPY STRUCTURES

OBJECTIVES:

1. TO CLEARLY ARTICULATE DOUGLAS COUNTY CITY RAILWAY POLICY, NEEDS AND PRIORITIES IN THE CONTEXT OF THIS PROJECT.
2. TO ARRIVE AT A CONSENSUS ON THE BRIEF INCLUSIONS AND SCOPE OF WORK.
3. TO REVIEW AND CLARIFY THE CURRENT PROJECT CONCEPTS AND IDENTIFY OPPORTUNITIES FOR ALTERNATIVE IMPROVEMENTS.
4. TO INCLUDE LIFE CYCLE COSTING.
5. TO IDENTIFY PROJECTS RISKS
6. TO REVIEW PROJECT CONSTRUCTION

FIGURE 2.

D.&.A.E.H. VMCON #6 VM STUDY DATA SHEET #6

PREVIOUS STUDIES: VM or NON-VM	STUDY TYPE:	DATE COMP.
INVESTIGATION OF ROOF CANOPIES & ASSOCIATED STEELWORK, DOUGLAS COUNTY STATION. "MACROENG" CONSULTING ENGINEERS. DATED JUNE 1993.	"DILAPIDATION SURVEY"	15 JUNE 1993

PREVIOUS STUDY RESULTS:

SUMMARY: "THE DAMAGE TO THE CONCRETE CANOPY SLAB HAS RESULTED FROM CORROSION OF SLAB REINFORCEMENT AND THE PERIMETER FASCIA PANELS. THE CORROSION OF THE SUPPORT STEELWORK IS CONCENTRATED MAINLY TO THOSE ELEMENTS IMMEDIATELY IN CONTACT WITH THE SLAB. THE EFFECTS OF THIS DILAPIDATION HAVE BEEN EXAMINED AND REPAIR PROCEDURES RECOMMENDED.

THE AREAS OF THE STRUCTURE WHICH HAVE INADEQUATE CAPACITY EITHER AS A RESULT OF THE DILAPIDATION OR INAPPROPRIATE STRUCTURAL DETAILS HAVE BEEN IDENTIFIED. THE RECOMMENDED REPAIRS HAVE BEEN CATEGORISED AS EITHER BEING CRITICAL, WHERE THE STRUCTURAL INTEGRITY HAS BEEN IMPINGED OR NON CRITICAL WHERE ONLY THE LONGEVITY OF THE STRUCTURE IS AFFECTED.

WE ["MACROENG"] ESTIMATE A BUDGET COST OF APPROXIMATELY $2.25 MILLION TO COMPLETE ALL THE REPAIRS RECOMMENDED IN * THIS REPORT AND A MINIMUM PROGRAMME OF 60 WEEKS TO COMPLETE THE WORK."

[* THE AFOREMENTIONED "MACROENG" REPORT].

FIGURE 3.

D.&.A.E.H. #12 INFORMATION PHASE DATA SHEET #4

WHAT IS IT? [Provide a Brief Statement]

STEEL SUPPORTED CONCRETE ROOF STRUCTURE OVER PLATFORMS 1 to 8 AT DOUGLAS COUNTY STATION.

MATERIAL: REINFORCED CONCRETE SLAB OF APPROXIMATELY 75mm THICKNESS [CONSTRUCTED LATE 1920's] SUPPORTED BY A STEEL STRUCTURE, FINISHED WITH STEEL FASCIA FOR THE FULL LENGTH OF THE STRUCTURE, APPROXIMATELY IN LINE WITH THE PLATFORM EDGE.

WHAT DOES IT DO? [Provide a Brief Statement]

PROVIDES A PERMANENT COVER FOR THE PLATFORMS AND AS SUCH, PROTECTS PASSENGERS AND STAFF FROM THE WORST OF THE ELEMENTS, viz. RAIN, HAIL, SNOW, EXTREME SUNSHINE AND THE MAJORITY OF THE PREVAILING WINDS. THE STEEL SUPPORTS ALSO HOUSE AND LOCATE THE DOWNPIPES FROM THE ROOF AREA. THE OVERHEAD POWER LINE SUPPORTS AND FITTINGS ARE LOCATED IN THE EDGE OF THE STRUCTURE.

WHAT MUST IT DO? [Use Active Verbs & Measurable Nouns]

COVER PLATFORM. PROTECT COMMUTERS. EXCLUDES RAIN. REDUCE TEMPERATURE. FACILITATES LAMINAR AIR-FLOW. SUPPORT CANOPY. REMOVE RUN-OFF. RECEIVE POWER FITTINGS. EXCLUDE MOISTURE. RESIST IMPACT. SUPPORT INDICATORS. ACCOMMODATE ENGINEERING SERVICES. ACCOMMODATE FITTINGS. PROTECT PLATFORMS.

IS IT REALLY NECESSARY? [Provide a Brief Statement]

YES, IT CONFORMS TO THE DOUGLAS COUNTY RAILWAY POLICY ON CUSTOMER SERVICE STANDARDS.

FIGURE 4.

D.&.A.E.H. #13 INFORMATION SHEET #5

WHAT DOES IT COST? USING MAJOR COMPONENTS/FUNCTIONAL AREAS: DESCRIPTION:	**COST: $**	**% OF THE TOTAL COST:**
REPAIR CONCRETE ROOF $1,300,000:00		52
REPAIR SUPPORTING STEELWORK $ 820,000:00		32.8
REPAIR STEEL FASCIAS	$ 225,000:00	9
REPAIR CORRODED STEEL WIRE GANTRIES $ 150,000:00		6
REPAIR STAIR SURROUNDS/RAILINGS $ 2,000:00		.08
PROVIDED BY CLIENT * TRADE COST FIGURES ONLY [e] $2,500,000:00		99.88%
ALTERNATIVE ESTIMATE FOR REPAIRS TO PLATFORMS 1 TO 8 DOUGLAS STATION		
CONCRETE ROOF CANOPY $1,100,000:00 Spall Repairs $750,000:00 Membrane/Protective Coating $350,000:00		48.73
CANOPY SUPPORT BEAMS $ 820,000:00 Repairs Type 1 $180,000:00 Repairs Types 2, 3 & 4 $640,000:00		36.33
WIRE TRUSSES/BEAMS Repairs To Support Columns [Repairs Types 5, 6 & 7] $70,000:00 Micaceous Iron Oxide Coating $75,000:00	$ 145,000:00	6.42
FASCIA TRUSSES	$ 190,000:00	8.41
STAIR	$ 2,000:00	0.08
EXTRACTED FROM SECTION 8 BUDGET ESTIMATE "MACROENG" REPORT 15 JUNE 1993		
COSTS TYPES: [a] ACTUAL [e] ESTIMATED [f] FUNDED: TOTAL: [e] $2,257,000:00		99.97

FIGURE 5.