THE CHALLENGE OF MAJOR PUBLIC SECTOR PROJECTS MANAGEMENT AND CONTROL

Your Presenter: Trevor Main, Chairman Trevor Main And Associates

Project Location

Location Melbourne Victoria
Population 4,000,000
2nd largest City in Australia
Port City
Commercial, Industrial Centre
Sporting Capital of Australia
Good Transport System
Major Sporting Venues seating over 100,000

Site Location three KM from the CBD,
Located on 20 Hectare Site
Inner Melbourne Suburb of Parkville

Site Location

Site Plan 20 Hectare

Games Village accommodated 6,000 Comprising 4,500 athletes and 1,5000 officials from over seventy nations and territories. These were accommodated into a mix of New Houses and apartments, restoration heritage buildings and removable infill housing. Games facilities such Kitchens, Administration was accommodated in marquee type temporary structures.

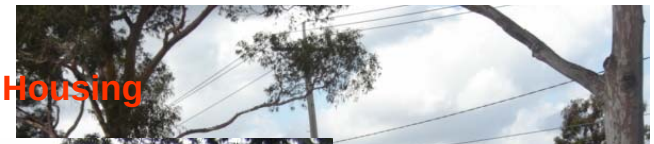
On completion of the Games all temporary facilities where removed and housing modified to permanent inner city accommodation

Landscaping Plan

Heritage Housing

Town Houses

FOUR HOUSING TYPES



Removable Infill Housing

Social Housing

Temporary Games Facilities

Temporary games facilities such Kitchens, Dining, Medical, Administration were accommodated in aluminum framed marquee type structures.

Structures bolted to concrete footings with temporary floor laid on prepared hardstand.

Apartment Buildings

Apartment Buildings, Home Office Building, extensive use was mode of pre-cast panel construction

Environmental And Sustainable Design and Construction Initiatives

Key Design Criteria

Use of Plantation Timber

Six Star Energy Rating for all new housing

Solar Hot water systems

Recycling of Building Materials

Water Collection and recycling (Gray Water System)

Traffic Management

Noise Contouring

High standard of finishes with low maintenance

The Stakeholders

MPV Major Project Victoria

Major Projects Victoria's (MPV) mission is to deliver projects that achieve exceptional economic, social and environmental outcomes for the Victorian community.

Role: Project Managers for all permanent and temporary construction, project financials, and performance. Responsible directly to the minister and State premier.

OCGC Office of Commonwealth Games Co-ordination

Role: Establishing venue requirements, bumping in and out athletes and staff, games scheduling and administration.

M2006 Melbourne 2006

Coordination of all external infrastructure and venues in support of the games.

VPC Village Park Consortium

Role: Consortium of Developers and Government Agencies for the Village site. Responsible for the construction of all infrastructure and building facilities.

Role: Independent Consultant providing advice on project performance with respect to schedule and cost .

Project Controls

At the beginning of the TM engagement:

Project Controls System used by all parties was diverse and focused on their own project assigned roles.

The Master schedule comprised of a milestones table with access and target completion dates.

Limited planning and planning schedule maintenance by contractors.

No master plan detailing the full end to end schedule detailing design, approvals, procurement and construction in sufficient detail to facilitate the tracking of progress to the delivery of the 12 housing precincts(169 Houses), 17 buildings, infill housing and infrastructure .

Schedules used by contractors were un-resourced, No baseline to effectively gauge and control progress by calculating variance (Gains and slip in schedule from week to week)

No combined assessment of the project resource requirements to meet and maintain baseline schedule.

Low level usage and knowledge by contractors of project control systems (schedule) and their maintenance.

Performance reporting vague and not tied to specific deliverables.

Contractors were “Rowing their Own Boat” “Reporting Through Smoke and Mirrors”.

Given the uniqueness and scale of the event, “ A fixed date with No Slippage”, the concern was that the existing reporting system and management structure could not realistically assess progress nor forecast facilities would be completed on time.

With just 14 months to handover, it was considered prudent by the Government to seek the services of an independent and experienced professional reviewer, hence the engagement of TM.

Project Controls

First Action

Review all existing schedules and assess their level of detail, status and suitability for purpose.

It became evident that the success of the TM brief was to build an independent, fully resourced critical path schedule.

The schedule was built to clearly identify all stakeholder activities and key delivery milestones.

The schedule for each building was developed down to trade level.

Using our experience to assess trade labour requirements, estimated resources were assigned to the schedule.

All data was validated with contractors and suppliers with respect to procurement and material supply.

The schedule was then baseline and statused monthly for progress and performance evaluation using EVM techniques.

The concept was to build a realistic model of the project to assess progress and identify Contractor gains and slippage,

to simulate “What If Scenarios” to evaluate and advise on recovery strategies where required.

Other objectives and benefits using the independent model:

Assess the amount of construction material to be delivered and moved through the site, then determining the size and number of lay-down and holding areas for construction materials.

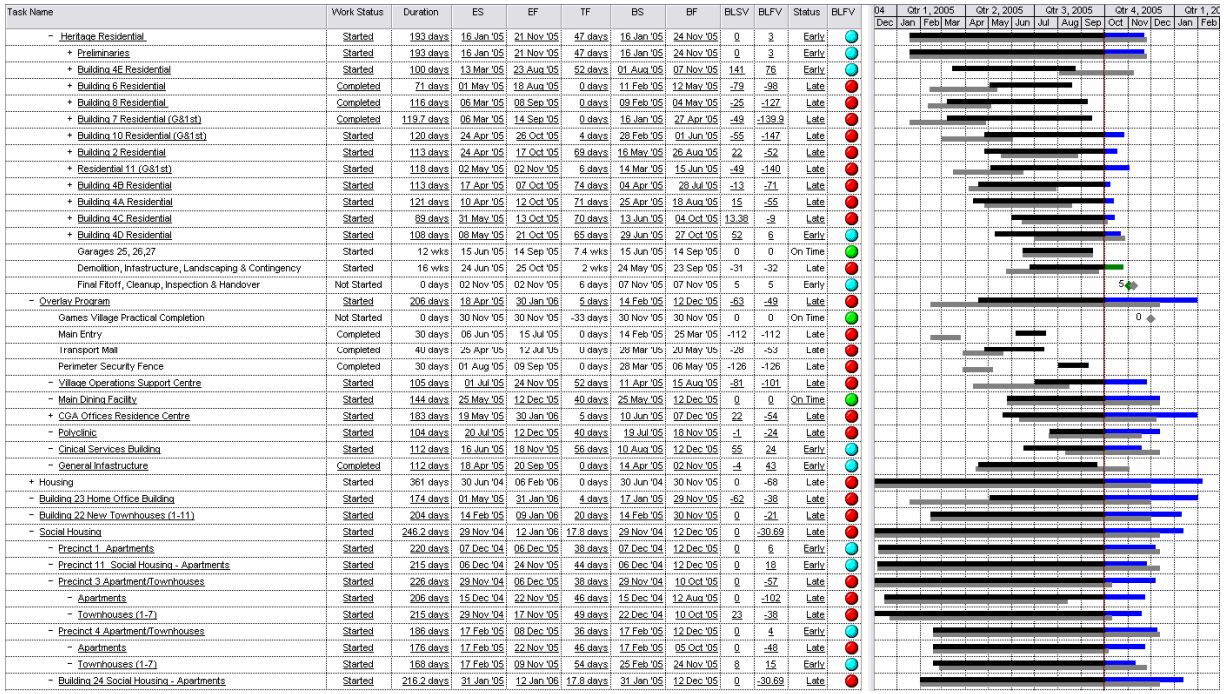
Assess the optimum location of site facilities and amenities. Assessment car parking requirements, look at staggered starts and site access (600 Workers arriving and leaving at the same time), local residential traffic control volumes and special scheduling of deliveries for infill housing.

Schedule consideration included constraints on work hours, constraints on use of parkland.

Possible effects of inclement weather and labour contingency requirements to cover these effects.

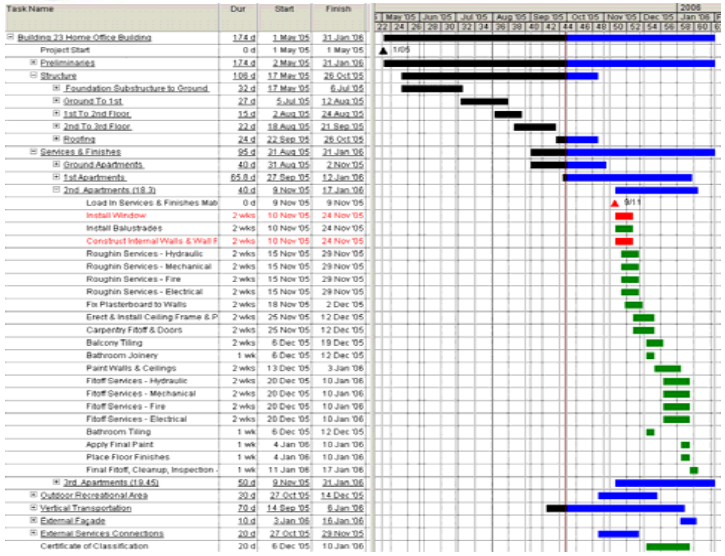
Use of manpower histograms to press contractors to ramp up trades and increased productivity.

Project Control Tools



Task Name	Work Status	Duration	ES	EF	TF	BS	BF	BLSV	BLFV	Status	BLFV
− Heritage Residential	Started	193 days	16 Jan '05	21 Nov '05	47 days	16 Jan '05	24 Nov '05	0	3	Early	
+ Preliminaries	Started	193 days	16 Jan '05	21 Nov '05	47 days	16 Jan '05	24 Nov '05	0	3	Early	
+ Building 4E Residential	Started	100 days	13 Mar '05	23 Aug '05	52 days	01 Aug '05	07 Nov '05	141	76	Early	
+ Building 6 Residential	Completed	71 days	01 May '05	18 Aug '05	0 days	11 Feb '05	12 May '05	-79	-98	Late	
+ Building 8 Residential	Completed	116 days	06 Mar '05	08 Sep '05	0 days	09 Feb '05	04 May '05	-25	-127	Late	
+ Building 7 Residential (G&1st)	Completed	119.7 days	06 Mar '05	14 Sep '05	0 days	16 Jan '05	27 Apr '05	-49	-139.9	Late	
+ Building 10 Residential (G&1st)	Started	120 days	24 Apr '05	26 Oct '05	4 days	28 Feb '05	01 Jun '05	-55	-147	Late	
+ Building 2 Residential	Started	113 days	24 Apr '05	17 Oct '05	69 days	16 May '05	26 Aug '05	22	-52	Late	
+ Residential 11 (G&1st)	Started	118 days	02 May '05	02 Nov '05	6 days	14 Mar '05	15 Jun '05	-49	-140	Late	
+ Building 4B Residential	Started	113 days	17 Apr '05	07 Oct '05	74 days	04 Apr '05	28 Jul '05	-13	-71	Late	
+ Building 4A Residential	Started	121 days	10 Apr '05	12 Oct '05	71 days	25 Apr '05	18 Aug '05	15	-55	Late	
+ Building 4C Residential	Started	89 days	31 May '05	13 Oct '05	70 days	13 Jun '05	04 Oct '05	13.38	-9	Late	
+ Building 4D Residential	Started	108 days	08 May '05	21 Oct '05	65 days	29 Jun '05	27 Oct '05	52	6	Early	
Garages 25, 26,27	Started	12 wks	15 Jun '05	14 Sep '05	7.4 wks	15 Jun '05	14 Sep '05	0	0	On Time	
Demolition, Infastructure, Landscaping & Contingency	Started	16 wks	24 Jun '05	25 Oct '05	2 wks	24 May '05	23 Sep '05	-31	-32	Late	
Final Fitoff, Cleanup, Inspection & Handover	Not Started	0 days	02 Nov '05	02 Nov '05	6 days	07 Nov '05	07 Nov '05	5	5	Early	
− Overlay Program	Started	206 days	18 Apr '05	30 Jan '06	5 days	14 Feb '05	12 Dec '05	-63	-49	Late	
Games Village Practical Completion	Not Started	0 days	30 Nov '05	30 Nov '05	-33 days	30 Nov '05	30 Nov '05	0	0	On Time	
Main Entry	Completed	30 days	06 Jun '05	15 Jul '05	0 days	14 Feb '05	25 Mar '05	-112	-112	Late	
Transport Mall	Completed	40 days	25 Apr '05	12 Jul '05	0 days	28 Mar '05	20 May '05	-28	-53	Late	
Perimeter Security Fence	Completed	30 days	01 Aug '05	09 Sep '05	0 days	28 Mar '05	06 May '05	-126	-126	Late	
− Village Operations Support Centre	Started	105 days	01 Jul '05	24 Nov '05	52 days	11 Apr '05	15 Aug '05	-81	-101	Late	
− Main Dining Facility	Started	144 days	25 May '05	12 Dec '05	40 days	25 May '05	12 Dec '05	0	0	On Time	
+ CGA Offices Residence Centre	Started	183 days	19 May '05	30 Jan '06	5 days	10 Jun '05	07 Dec '05	22	-54	Late	
− Polyclinic	Started	104 days	20 Jul '05	12 Dec '05	40 days	19 Jul '05	18 Nov '05	-1	-24	Late	
− Cinical Services Building	Started	112 days	16 Jun '05	18 Nov '05	56 days	10 Aug '05	12 Dec '05	55	24	Early	
− General Infastructure	Completed	112 days	18 Apr '05	20 Sep '05	0 days	14 Apr '05	02 Nov '05	-4	43	Early	
+ Housing	Started	361 days	30 Jun '04	06 Feb '06	0 days	30 Jun '04	30 Nov '05	0	-68	Late	
− Building 23 Home Office Building	Started	174 days	01 May '05	31 Jan '06	4 days	17 Jan '05	29 Nov '05	-62	-38	Late	
− Building 22 New Townhouses (1-11)	Started	204 days	14 Feb '05	09 Jan '06	20 days	14 Feb '05	30 Nov '05	0	-21	Late	
− Social Housing	Started	246.2 days	29 Nov '04	12 Jan '06	17.8 days	29 Nov '04	12 Dec '05	0	-30.69	Late	
− Precinct 1 Apartments	Started	220 days	07 Dec '04	06 Dec '05	38 days	07 Dec '04	12 Dec '05	0	6	Early	
− Precinct 11 Social Housing - Apartments	Started	215 days	06 Dec '04	24 Nov '05	44 days	06 Dec '04	12 Dec '05	0	18	Early	
− Precinct 3 Apartment/Townhouses	Started	226 days	29 Nov '04	06 Dec '05	38 days	29 Nov '04	10 Oct '05	0	-57	Late	
− Apartments	Started	206 days	15 Dec '04	22 Nov '05	46 days	15 Dec '04	12 Aug '05	0	-102	Late	
− Townhouses (1-7)	Started	215 days	29 Nov '04	17 Nov '05	49 days	22 Dec '04	10 Oct '05	23	-38	Late	
− Precinct 4 Apartment/Townhouses	Started	186 days	17 Feb '05	08 Dec '05	36 days	17 Feb '05	12 Dec '05	0	4	Early	
− Apartments	Started	176 days	17 Feb '05	22 Nov '05	46 days	17 Feb '05	05 Oct '05	0	-48	Late	
− Townhouses (1-7)	Started	168 days	17 Feb '05	09 Nov '05	54 days	25 Feb '05	24 Nov '05	8	15	Early	
− Building 24 Social Housing - Apartments	Started	216.2 days	31 Jan '05	12 Jan '06	17.8 days	31 Jan '05	12 Dec '05	0	-30.69	Late	

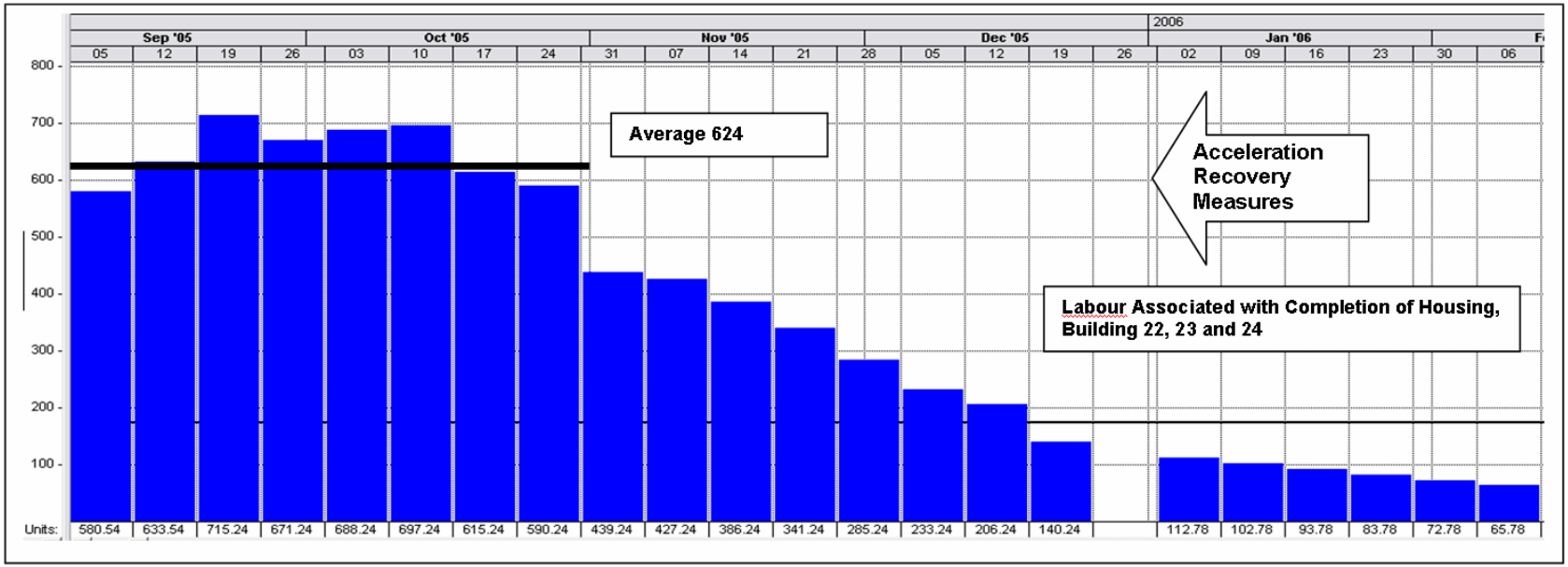
Planning requirements was met using Microsoft project 2003.



Task Name	Dur	Start	Finish
− Building 23 Home Office Building	174 d	1 May '05	31 Jan '06
Project Start	0 d	1 May '05	1 May '05
+ Preliminaries	174 d	2 May '05	31 Jan '06
− Structure	108 d	17 May '05	26 Oct '05
+ Foundation Substructure to Ground	32 d	17 May '05	6 Jul '05
+ Ground To 1st	27 d	5 Jul '05	12 Aug '05
+ 1st To 2nd Floor	15 d	2 Aug '05	24 Aug '05
+ 2nd To 3rd Floor	22 d	18 Aug '05	21 Sep '05
+ Roofing	24 d	22 Sep '05	26 Oct '05
− Services & Finishes	95 d	21 Aug '05	31 Jan '06
+ Ground Apartments	40 d	31 Aug '05	2 Nov '05
+ 1st Apartments	65.8 d	27 Sep '05	12 Jan '06
− 2nd Apartments (18 3)	40 d	9 Nov '05	17 Jan '06
Load In Services & Finishes Mat	0 d	9 Nov '05	9 Nov '05
Install Window	2 wks	10 Nov '05	24 Nov '05
Install Balustrades	2 wks	10 Nov '05	24 Nov '05
Construct Internal Walls & Wall F	2 wks	10 Nov '05	24 Nov '05
Roughin Services - Hydraulic	2 wks	15 Nov '05	29 Nov '05
Roughin Services - Mechanical	2 wks	15 Nov '05	29 Nov '05
Roughin Services - Fire	2 wks	15 Nov '05	29 Nov '05
Roughin Services - Electrical	2 wks	15 Nov '05	29 Nov '05
Fix Plasterboard to Walls	2 wks	18 Nov '05	2 Dec '05
Erect & Install Ceiling Frame & P	2 wks	25 Nov '05	12 Dec '05
Carpentry Fitoff & Doors	2 wks	25 Nov '05	12 Dec '05
Balcony Tiling	2 wks	6 Dec '05	19 Dec '05
Bathroom Joinery	1 wk	6 Dec '05	12 Dec '05
Paint Walls & Ceilings	2 wks	13 Dec '05	3 Jan '06
Fitoff Services - Hydraulic	2 wks	20 Dec '05	10 Jan '06
Fitoff Services - Mechanical	2 wks	20 Dec '05	10 Jan '06
Fitoff Services - Fire	2 wks	20 Dec '05	10 Jan '06
Fitoff Services - Electrical	2 wks	20 Dec '05	10 Jan '06
Bathroom Tiling	1 wk	6 Dec '05	12 Dec '05
Apply Final Paint	1 wk	4 Jan '06	10 Jan '06
Place Floor Finishes	1 wk	4 Jan '06	10 Jan '06
Final Fitoff, Cleanup, Inspection	1 wk	11 Jan '06	17 Jan '06
3rd Apartments (19.45)	50 d	9 Nov '05	31 Jan '06
+ Outdoor Recreational Area	20 d	27 Oct '05	14 Dec '05
+ Vertical Transportation	70 d	14 Sep '05	6 Jan '06
+ External Façade	10 d	3 Jan '06	16 Jan '06
+ External Services Connections	20 d	27 Oct '05	29 Nov '05
Certificate of Classification	20 d	6 Dec '05	10 Jan '06

Used for Master Schedule Detailing All facilities With Actual/Forecast Versus Baseline and Schedule Variance report.

Used to detail schedule to Trade based activity level.



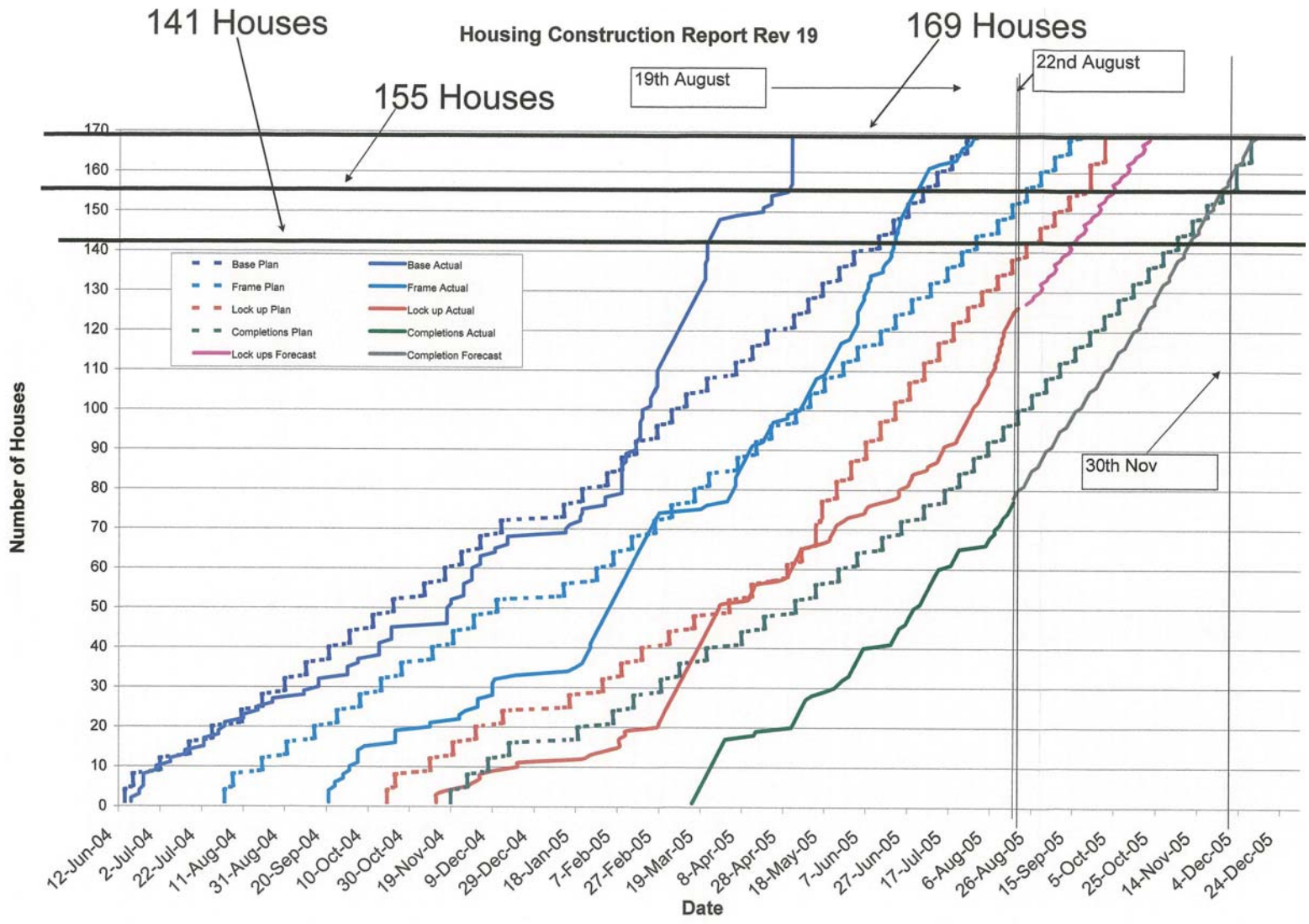
Used to generate labour Histogram to Analyse workforce requirement to complete project by end December 2005.

Project Control Tools

Earned Value Performance measurement and Reporting was done using EVE Earned Value Engine Project Control Software, www.evengine.biz

EVE generated “Time Displacement Curves” for monitoring house construction.

The diagram illustrates AC – Actuals, ETC – Estimate To Completion Versus PV-Planned Value for the major stages of house construction.



Note the late start for all key performance indicators such as Frame, Lockup and Completion with an acceleration in the later part of the project.

Had the baseline PV Planned Value been followed there may have been cost savings, better utilization of resources and greater efficiency to the construction.

Time Displacement curves/diagrams are successfully used in serial type production environments. The diagrams can also be used to visually assess progress and need for acceleration.

Outcome

The result of TM's engagement was that within two months all contractors significantly increased their committed resources to the site.

The SCM supply Chain Management of the project was significantly improved.

Progress reporting was significantly improved and performance trends noted and actioned on.

Lessons Learned

Qualify Participants for Technical Experience, having previously worked as part of a multi-disciplined combined team.

Appoint a strong and independent Project Controls team able to model and control the project strategically and at detailed level.

Enforce Contractors have resources experienced in using project planning software.

Specify compatible software systems to exchange data across the project.

Specify project wide EVM performance measurement criteria across the project.

Have a Management Team that understands the output from the project controls team.

Have a Management Team with the power to direct project contractors.

Other Issues for consideration:

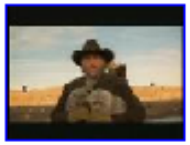
Need for good Public Consultation Management – Managing the Qualitative Impact on the development and minimizing development objection.

Consultation and Site Agreement With Labour Unions.

Work Practices To be determined before project commences.

Staged Handovers to be determined before commencement of

Maintenance of the Asset before project handover.



YouTube - cowboys **herding cats**
funny ads, cowboys **herding cats**, who can ever imagine?
1 min 7 sec - ★★★★★
www.youtube.com/watch?v=Pk7yqlTMvp8

In Truth Managing this Project Was Like "Herding Cats"