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Corangamite Catchment Management Authority and the City of Greater Geelong

A.S. Miner Geotechnical

Case Study for Erosion and Landslides.

Great Ocean Road (1949)

Report No: 356.3/32/06

Prepared for Troy Clarkson

Department of Primary Industries

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and

Leigh Dennis

Corangamite Catchment Management
Authority

64 Dennis Street

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1. Site Description

1.1 Site I.D.

356.3/32

1.2 Site address

The Great Ocean Road 1949

1.3 Brief site description and general overview

This case study provides some details for impacts by landslides to the Great Ocean Road during 1949/1950 in the Otway Region.

1.4 Map datum/ Map projection/ Zone

NGA Zone 54 (GDA94)

1.5 Easting

Start E 789920 and Finish E 659260

1.6 Northing

Start N 5751550 and Finish N 5728340

1.7 Municipality

Surfcoast and Colac Otway

1.8 CCMA landscape zone

Otway Coast

1.9 Previous ID

Multiple

1.10 Previous Data Source

2. Hazard Description

2.1 Soil degradation type

Landslides

2.2 Soil degradation sub-class

Slides rockfalls and debris flows

2.3 Description of hazard present on site or threatening site from above or below

Rockfalls slides and collapses of bridges occurred during heavy flooding in October 1949 (see attached photos). The result was traffic was blocked between Lorne and Apollo Bay with a section between Lorne and Anglesea also closed but for a shorter period. Principal damage derived from slips from the high side of the road but more serious slips also occurred on the low side which involved the provision of retaining walls. The slide at Cape Patton (see Photos) is a good example of a low side slide.

2.4 Dimensions of Hazard (width, length and depth if appropriate)

Various

2.5 Extent of Hazard (spatial area and volume if appropriate)

Various

2.6 Magnitude of hazard (travel distance or rate of occurrence)

Various

2.7 List previous reports or studies relevant to this site

A950-51 Country Roads Board Thirty Seventh Annual Report for the year ending 30th June 1950.

2.8 Custodian of previous reports and studies

Peter Dahlhaus

3. The Event Has Already Occurred

3.1 Date of first occurrence

Ongoing failures have been recorded on the Great Ocean Road since its construction and opening in November 1932. One of Lorne's oldest living resident Eilenn Quick 92 recalled in an article in the Royal Auto Magazine that "landslips would close the road for months at a time."

3.2 Date of most recent re-activation or acceleration

Considerable damage was sustained during and directly after the heavy rains between the 22nd and the 24th of October 1949.

3.3 Actual or postulated trigger event including magnitude and duration

7.30 inches or 185 mm of rain in three days was recorded at Lorne. (Daily rainfall events of 152.4 mm on the 24/10/1949 at Lorne and 92.2 mm on the 24/10/1949 at Apollo Bay were recorded)

3.4 Frequency of Trigger Event if known

The Lorne rainfall event is ranked 2nd out of 44,606 daily rainfall records with an Antecedent Rainfall Probability of Exceedence Threshold (or ARPET) value = 0.0045%. The Apollo Bay event is ranked 7th out of 36,767 daily rainfall records with an Antecedent Rainfall Probability of Exceedence Threshold (or ARPET) value = 0.015%

3.5 What damage or impact occurred?

In all, damage occurred at 38 points between Lorne and Apollo Bay as well as damage to a culvert and filling at Chapman's Creek (see Photo) and the loss of a bridge near Apollo Bay (see Photo).

3.6 Was there a risk of injury or loss of life?

There was probably an increased risk to users of the road due to sudden failures and loss of the road on sharp bends. This would have undoubtedly posed some degree of risk to life.

3.7 How important was it?

Very important to the local communities given it was the only form of land access

3.8 What asset classes were impacted?

Infrastructure

3.9 What asset sub classes were impacted?

Roads and retaining walls

3.10 What are the asset values?

Roads (major)=8

3.11 How severely were assets impacted?

Significant damage was sustained and recorded.

3.12 Estimated cost of impact (including qualitative and quantitative costs for loss of asset, investigations, remedial works, cultural, business and environment)

The total estimated cost of repairs works was 15000 pounds in 1950 economic terms

4. Remediation Has Already Been Undertaken

4.1 What remediation option was used?

Slips were probably removed by machine (excavator) and side cast over the coastal edge of the road. New retaining walls were built at some locations including Cape Patton.

4.2 How was the site initially assessed?

Unknown

4.3 How was the remediation designed and by who?

Assumed to be Country Road Board

4.4 Did it require specialist equipment or subcontractors?

Unknown

4.5 How effective has the remediation been?

Failures have continued to occur along the Great Ocean Road up until the present

4.6 How was the effectiveness judged?

N/A

4.7 Would other treatments worked here?

N/A

4.8 Was it early intervention or reactive?

Reactive to damage sustained during the heavy rainfall event

4.9 What was the cost of remediation (including design, construction and implementation)?

15000 pounds

4.10 How was the remediation funded?

Through CRB funds

5. Ongoing Review and Monitoring Requirements

5.1 What is the likely ongoing monitoring and review strategy?

Unknown

5.2 What is the nature of future monitoring and maintenance?

Unknown

5.3 What are the likely costs of monitoring and maintenance?

Unknown

Photos

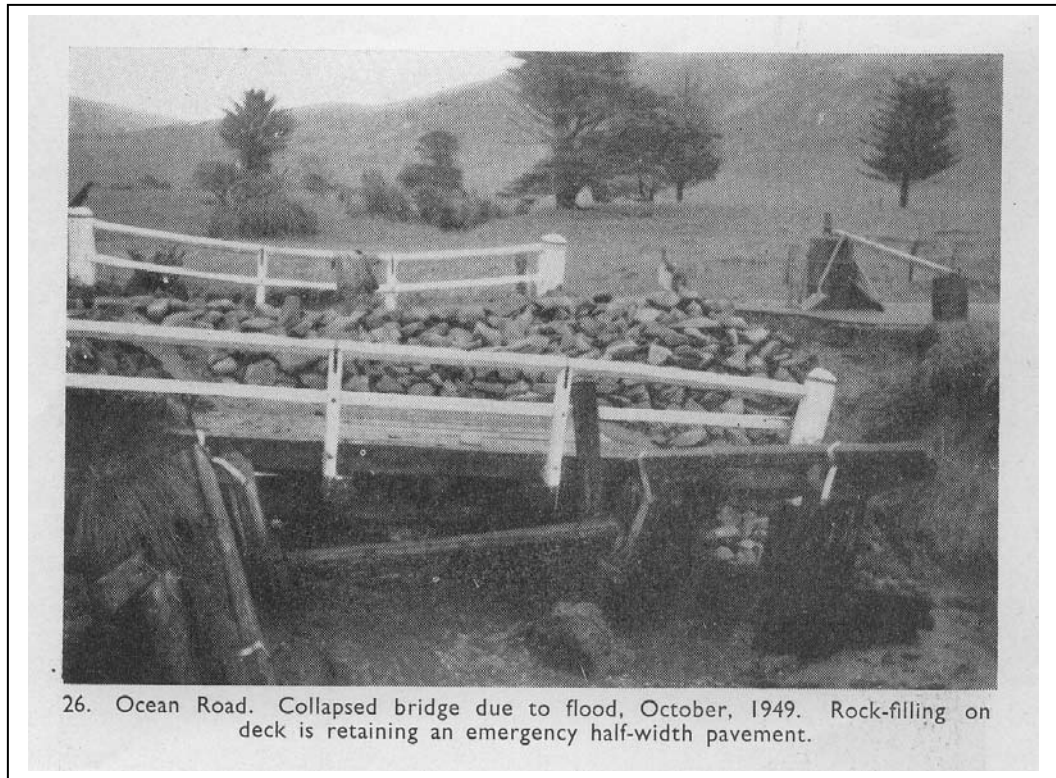


Photo 1

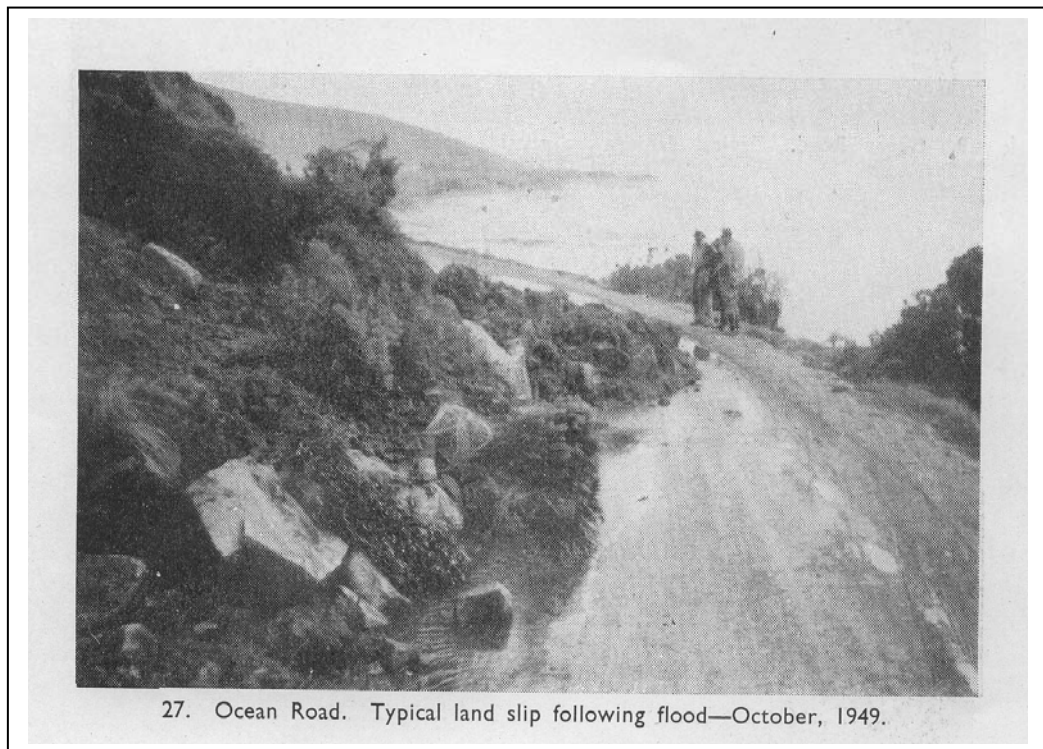


Photo 2

Photos

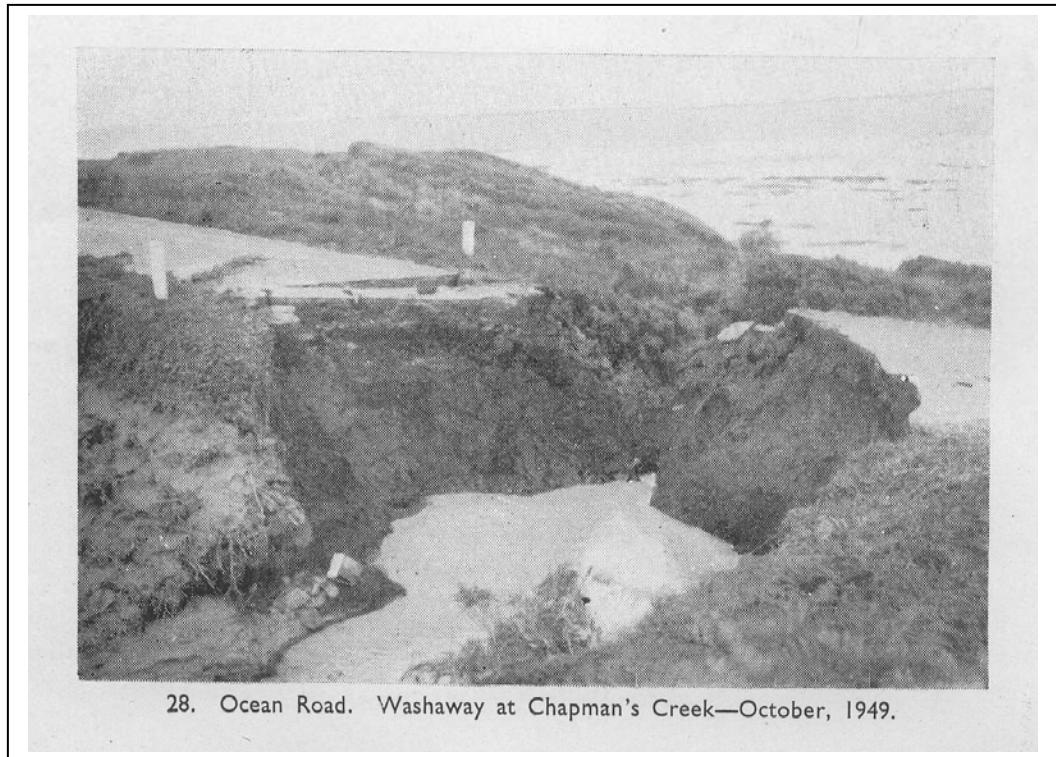


Photo 3

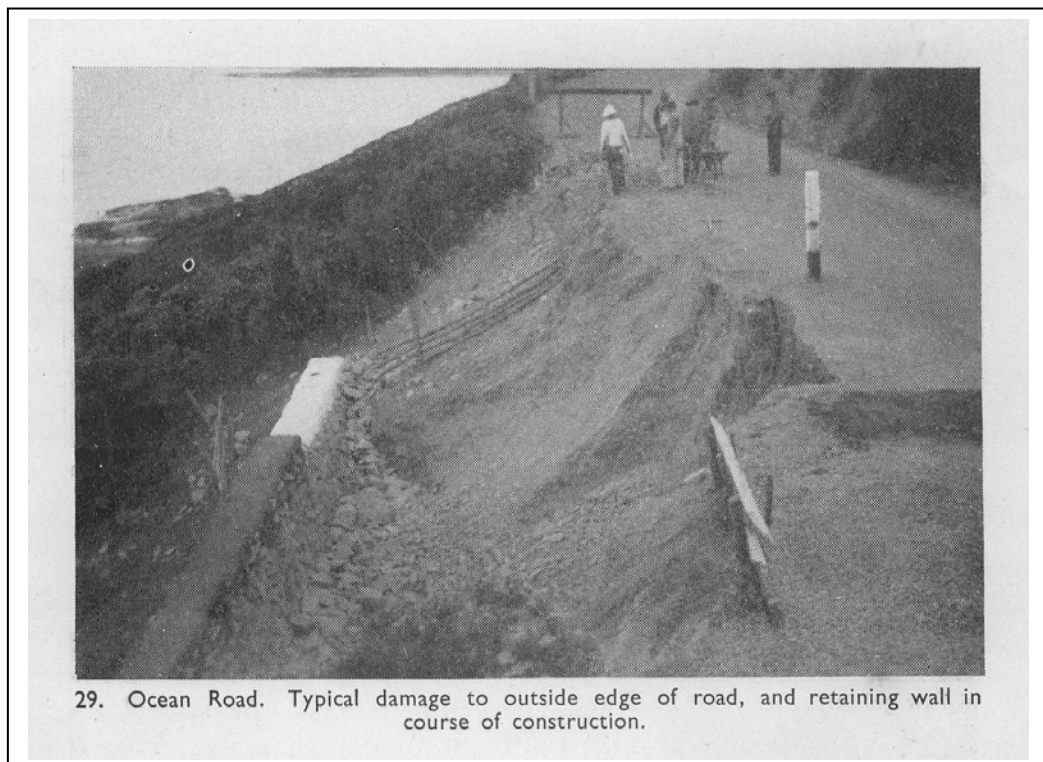


Photo 4

Photos

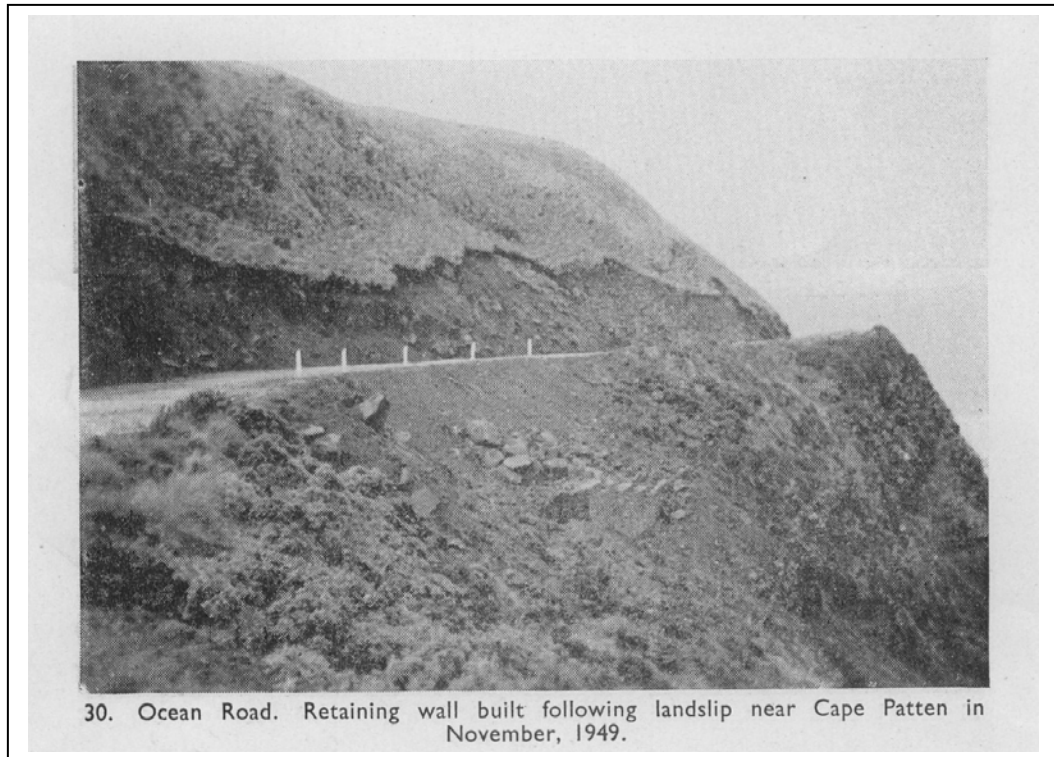


Photo 5

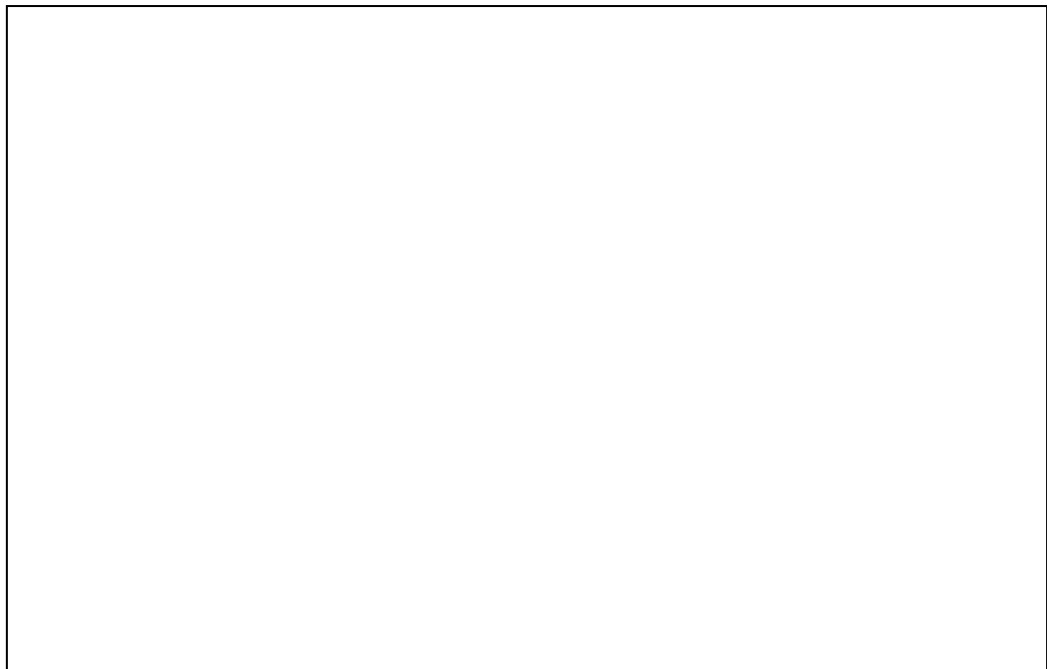


Photo 6

Photos

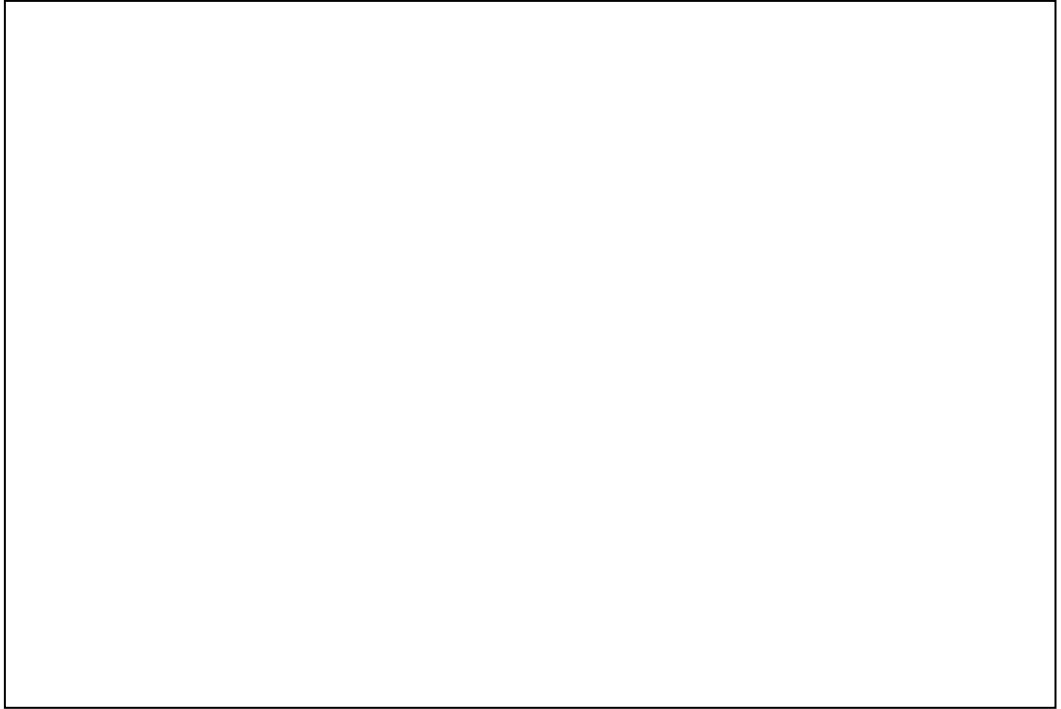


Photo 7

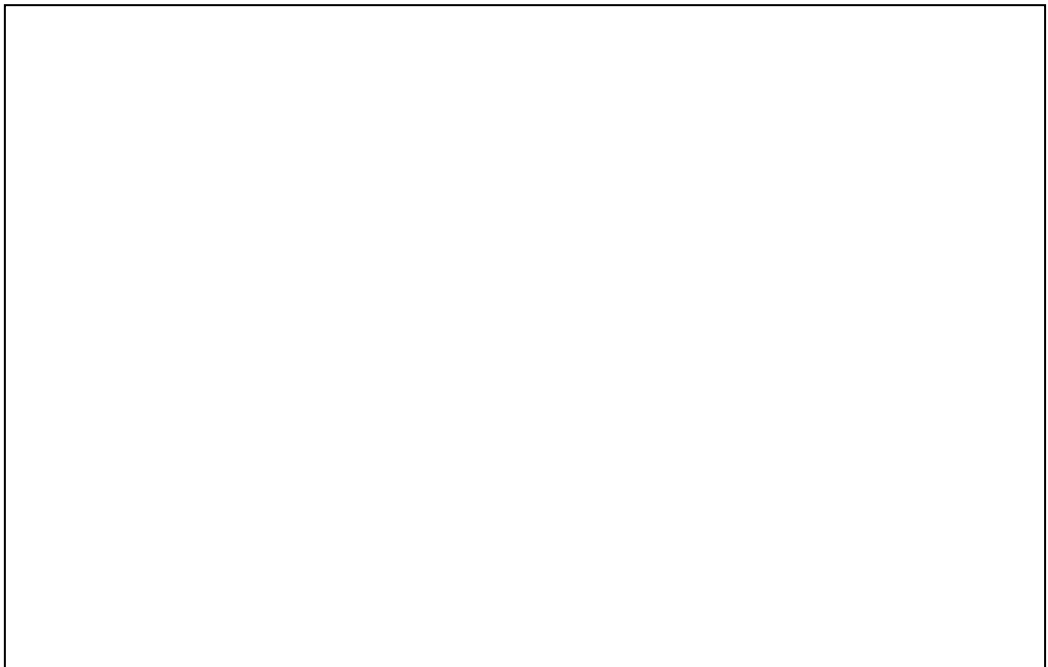


Photo 8

Sketches and Drawings