



## Section 3 – Monitoring & Process

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## 3 Monitoring & Process

### 3.1 Construction Monitoring Services

Construction monitoring is a service which provides the client and where assets are vested, provides Council with independent verification through a certification statement (to the extent of the consultant's engagement) that the works have been completed in accordance with specified requirements.

For the purposes of this code and providing a basis of "reasonable grounds" for issuing a producer statement or similar certification, monitoring shall include but not be limited to the following:

- Visual inspection, measurement, and testing (including random verification testing) of works in progress and completed works.
- Written and verbal communication with contractors to ensure the contract standards and outcomes are in accordance with approved plans and this code.
- Ensuring that the contractor's Quality Assurance meets the requirements of this code and best practice appropriate to the nature and scale of the work.
- Ensuring that that the contractor's Quality Management is implemented in accordance with the approved Quality Plan by independent auditing of records and random verification testing of works and materials.
- Ensuring that variations to the design are recorded on as-built drawings.

This section shall be read in conjunction with clauses within DS1 – General Provisions.

Most construction projects are unique, but unlike manufactured products which are often thoroughly tested and evaluated during construction and prior to being brought into service, the completed project is rarely tested for all design requirements. Construction works are also complex in detail and skilled professional involvement is necessary for the successful execution of such projects.

Five levels of construction monitoring service are defined. The decision as to which level is appropriate will be project dependent.

Factors influencing the level of construction monitoring for a project are:

- the size of the project
- the importance of the project
- the complexity of the construction works
- the experience and demonstrated skill in quality management of the constructor
- the consequence of non compliance

The primary responsibility for completing the contract works in accordance with the requirements of the plans and specifications is the constructor's.

The involvement of the consultant is important during the construction phase to ensure that:



- the design is being correctly interpreted
- the construction techniques are appropriate and do not reduce the effectiveness of the design
- the work is completed generally in accordance with the plans and specifications

The risk of non-compliance can be reduced by increasing the involvement of the consultant. All factors should be considered before deciding upon the most appropriate level of construction monitoring for the project.

Table 1 sets out the five levels of construction monitoring, describes the types of review and indicates where a particular level of monitoring is appropriate.

Tables 2 and 3 provide rating values for various aspects of a project to enable an assessment of an appropriate monitoring level to be made.

An increase in the quality monitoring of the project works by the consultant significantly reduces the risk that the materials or components do not meet specified requirements, the design has been incorrectly interpreted, and/or poor quality workmanship has been incorporated in the project.

The level of construction monitoring suitable for a project can be obtained as follows:

Select value of KA to KD from Table 2 and sum total.

A value for each K Factor must be included.

**Table 1**

Level	Review	Comment
CM1	<p>Monitor the outputs from another party's quality assurance programme against the requirements of the plans and specifications.</p> <p>Visit the works at a frequency agreed with the client to review important materials of construction critical work procedures and/or completed plant or components.</p> <p>Be available to advise the constructor on the technical interpretation of the plans and specifications.</p>	<p>This level is only a secondary service.</p> <p>It may be appropriate:</p> <ul style="list-style-type: none"> <li>▪ for the design consultant when another party is engaged to provide a higher level of construction monitoring or review during the period of construction</li> <li>▪ or when the project works are the subject of a performance based specification and performance testing is undertaken and monitored by others.</li> </ul>
CM2	<p>Review, preferable at the earliest opportunity, a sample of each important work procedure, material or construction and component for compliance with the requirements of the plans and specifications and review a representative sample of each important completed work prior to enclosure or completion as</p>	<p>This level of service is appropriate for smaller projects of a routine nature being undertaken by an experienced and competent constructor and where a higher than normal risk of non compliance is acceptable. It provides for the review of a representative sample of work procedures and materials of construction. The</p>



	<p>appropriate.</p> <p>Be available to provide the constructor with technical interpretation of the plans and specifications.</p>	<p>assurance of compliance of the finished work is dependent upon the constructor completing the work to at least the same standard as the representative sample reviewed.</p>
CM3	<p>Review, to an extent agreed with the client, and Council when assets are to be vested, random samples of important work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review important completed work prior to enclosure or on completion as appropriate.</p> <p>Be available to provide the constructor with technical interpretation of the plan and specifications.</p>	<p>This level of service is appropriate for medium sized projects of a routine nature being undertaken by an experienced constructor when a normal risk of non compliance is acceptable.</p>
CM4	<p>Review, at a frequency agreed with the client, and Council when assets are to be vested, regular samples of work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review the majority of completed work prior to the enclosure or on completion as appropriate.</p>	<p>This level of service is appropriate for projects where a lower than normal risk of non compliance is required.</p>
CM5	<p>Maintain personnel on site to constantly review work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate.</p>	<p>This level of service is appropriate for:</p> <ul style="list-style-type: none"><li>▪ Major projects</li><li>▪ Projects where the consequences of failure are critical</li><li>▪ Projects involving innovative or complex construction procedures</li></ul> <p>The level of service provides the client with the greatest assurance that the completed work complies with the requirements of the plans and specifications.</p>

**Table 2: Assessing the Value of the Construction Work**

CRITERIA	K	ASSESSMENT				VALUE
Project Status	K <sub>A</sub>	Small 1	Medium 2	Large 3	Major 4	
Complexity of work procedures	K <sub>B</sub>	Routine 2	Difficult 4	Complex 6		
Relevant experience of constructor	K <sub>C</sub>	Inexperienced 6	Experienced 2	Certified ISO 9000 1		
Consequences of non-compliance	K <sub>D</sub>	Minor 1	Moderate 4	Serious 6	Critical 12	
KTOTAL: K <sub>A</sub> + K <sub>B</sub> + K <sub>C</sub> + K <sub>D</sub>						

Note: Council considers the consequence of non-compliance for underground services to have an assessment value of critical = 12

Use K<sub>TOTAL</sub> to select the level of construction monitoring appropriate from Table 3.

**Table 3**

KTOTAL	CM1	CM2	CM3	CM4	CM5
5-6		Sampling Only	-	-	-
7-8		N/A	Weekly	-	-
9-10		N/A	Twice Weekly	-	-
11-12	Secondary Service	N/A	N/A	Twice Weekly	-
13-14		N/A	N/A	Every 2nd day	-
15-16		N/A	N/A	Daily	
17+		N/A	N/A	N/A	Constant

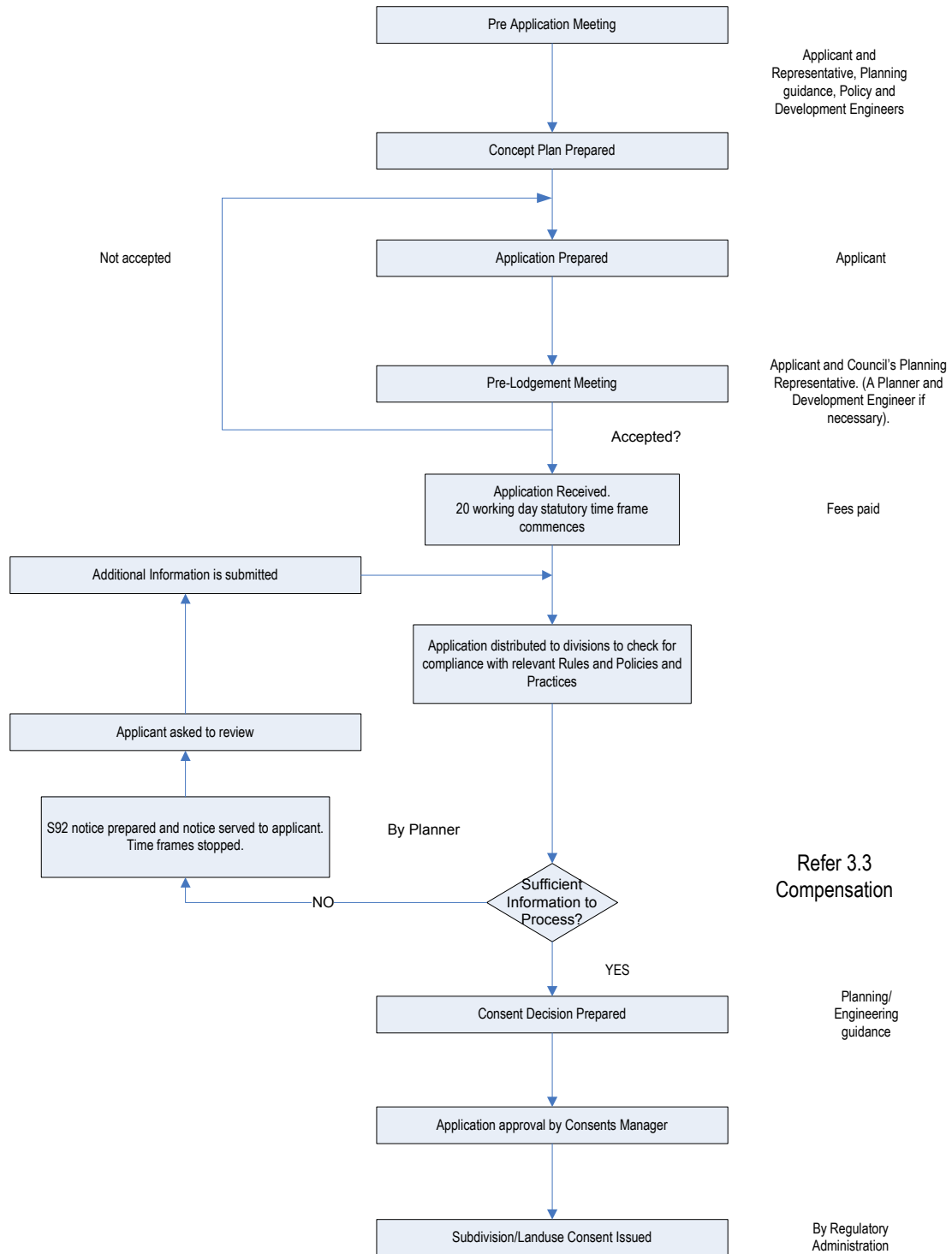
N/A = Not Appropriate

Secondary Service = This level of service is only appropriate when another party is responsible for undertaking the primary review of construction standards

Table 3 indicates the frequency of review considered to be appropriate for the project concerned. Frequency of inspection is intended to be indicative of involvement with actual frequency dependent on the rate of progress of the works.

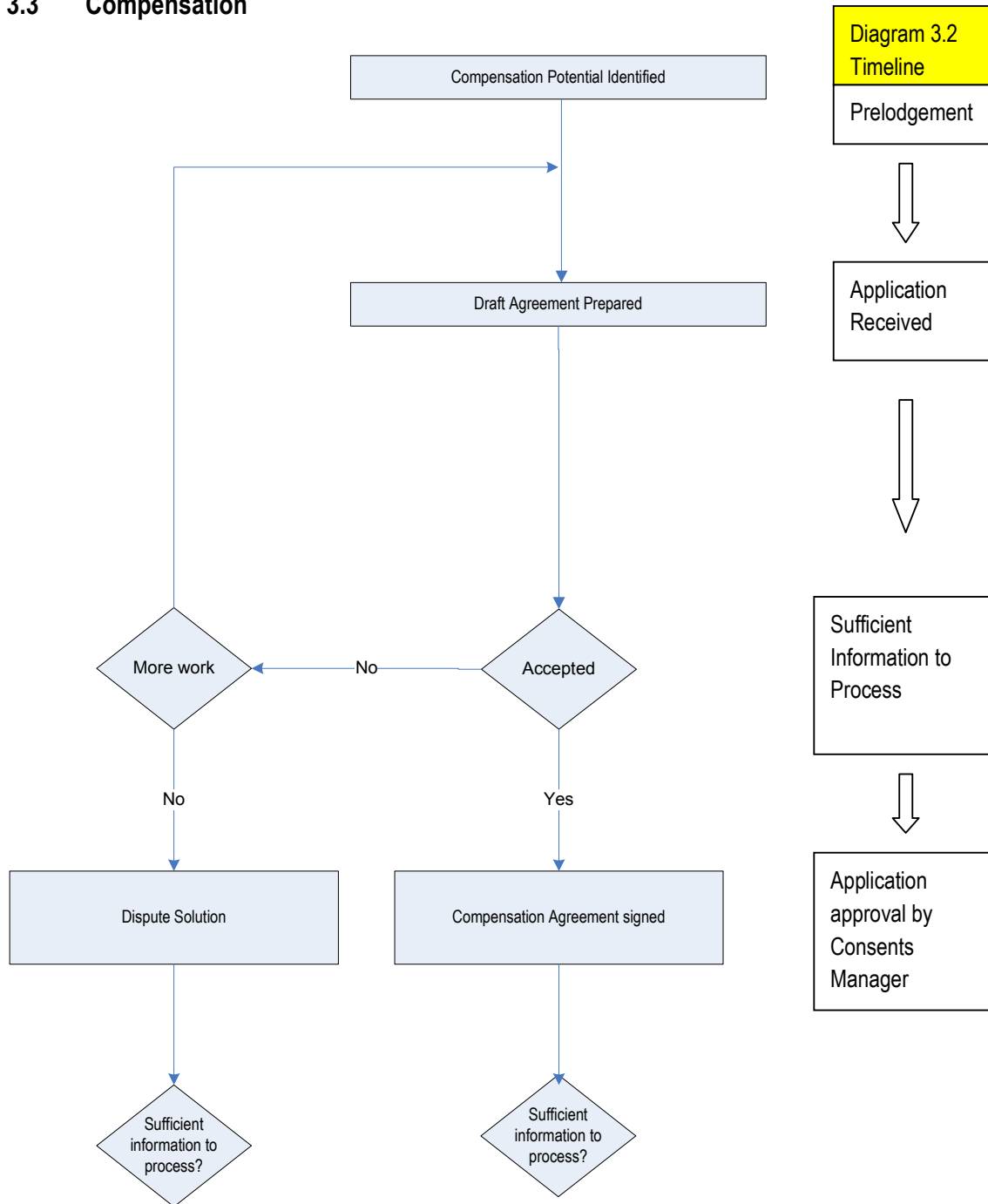


### 3.2 Subdivision/Land Use Consent Process



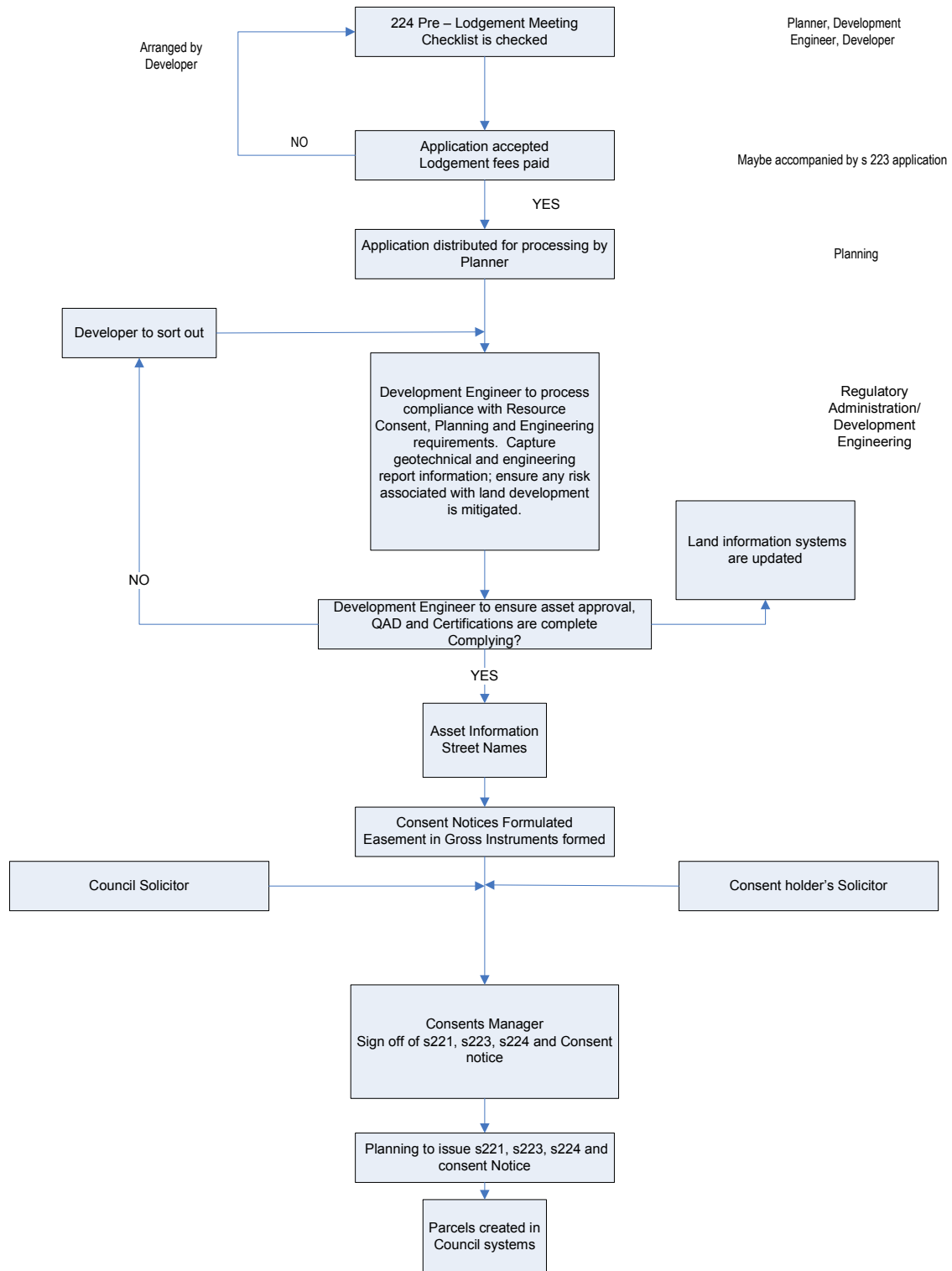


### 3.3 Compensation





### 3.4 224 Process







### 3.5 Variation Procedure to Amend Approved Development Plans

