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Design development post contract signing - client or contractors cost?

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Design development post contract signing - client or contractors cost?

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Abstract (150 words)

By offering fixed price contracts for designs supplied by clients, contractors legally warrant that they can build what has been designed and do so within their fixed price. Yet detailed drawings are often issued during construction in response to contractors' requests for information on the basis that they cannot otherwise build what has been designed. Claim entitlement decisions are often made by construction professionals (Architects, Engineers, Quantity Surveyors) without legal training in contractual interpretation, potentially varying who pays for design development after contract signing, contractors or clients. Prior studies have addressed buildability obligations relating to ground conditions and foundations. This study applies key principles of contract law to consider who should pay for instructed drawing details post contract signing under of New Zealand Standard NZS3910:2012 *Conditions of Contract for Building and Civil Engineering Construction* in terms of (i) when a variation claim may be accepted; (ii) effect of contractor involvement in design development; and (iii) effect if claimed from a building subcontractor to a consultant manager (no head contractor). A claim entitlement flowchart and a table comparing head contractor and consultant construction manager obligations provide practical guides for contract administrators. Identifying terms prone to interpretation informs contract drafters toward reducing ambiguity for contract users and therefore the potential for dispute.

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1. Introduction

This paper sets out to establish who pays for detailed design development once a fixed price construction contract has been entered into under NZS3910:2013 *Conditions of Contract for Building and Civil Engineering Construction* (Standards New Zealand, 2013). Consider this scenario: A head contractor is employed through a fixed price construction contract to build a new university block. During construction, they submit a request for information (RFI) requesting further drawing details for particularly complex areas on the basis that they cannot otherwise build what has been designed. The contract administrator (called an Engineer under NZS3910:2013) issues drawing details. The head contractor then submits a variation claim for the detailed work, including timber blocking, bolt fixings, flashings and seals. Research objectives include establishing:

- I. when the variation claim may be accepted;
- II. effect of contractor involvement in design development;
- III. effect if claimed from a building subcontractor to a consultant construction manager (CCM) (i.e., no head contractor).

Claim entitlement has largely been decided by contract administrators who are lay-construction professional (quantity surveyors, project managers, architects, engineers). However, until recently, tertiary level construction qualifications have contained little or no content on contract interpretation, effectively reserving such content to university law programmes across New Zealand. Lay-readers may interpret written clauses (*express terms*) differently to those who have studied the influence of *implied* terms that exist through case law precedent or legislation. For example, general clause phrases, such as 'anything reasonably unforeseeable by an experienced contractor' may appear to provide grounds for extending time due to delay caused by the client. However, such clauses have been found ineffective by courts on that basis that changing from the common law position (in this case that an *act of prevention* would constitute a breach of contract not a variation to it) requires specific provisions to do so (Thomas and Wright, 2011).

30

31 Deciding whether drawings instructed during construction vary the contractor's fixed price
32 contract is more complicated than when clients simply instruct scope changes. This is because,
33 the long held common law position is that, by offering a fixed price contract based on drawings
34 supplied by the client, the contractor legally warrants that they can build what has been
35 designed and do so for the fixed price offered. This is based on principles of contract law
36 including *absolute liability*, *fitness for purpose* and the *inclusive price principle*. Yet when
37 contractors request details during construction they are effectively doing so on the very basis
38 that they could not otherwise build what has been designed. Key considerations include,
39 whether the contract might be deemed *frustrated* on the basis that the design problem was
40 reasonably unforeseeable and performance would otherwise be impossible without doing the
41 work, therefore entitling the contractor to claim costs outside of the of contract, whether the
42 detail corrects a design documentation error, and whether any costs could have been mitigated
43 by the contractor warning in advance. A further complication is designers being found negligent
44 for their drawings lacking 'buildability', in case law and under the New Zealand Licensed
45 Building Practitioner (LBP) scheme.

46

47 This is particularly topical in New Zealand as more detailed drawings are being instructed after
48 contract signing. Growth across the sector has seen contractors entering fixed price contracts
49 based on incomplete designs and contract terms, that were standard form, now often amended
50 in order to transfer greater risk onto contractors. Incomplete drawings have been found a
51 dominant source of contract variations and contractor tender risk amongst Australian
52 contractors (Tower and Bacarini, 2008). The risk transfer onto both contractors and consultants
53 in New Zealand has been described as reaching 'inequitable' levels (NZIQS, 2019) and there
54 are calls for better risk equity and greater focus on risk training across the construction industry
55 (NZIOB, 2019). This follows major players existing the sector, including Fletcher Construction,
56 Mainzeal and Ebert Construction (Harris, 2018).

57

58 The introduction of early contractor involvement (ECI) further complicates design obligations,
59 when contractors or consultant managers provide early input into design buildability. The entity

60 responsible for managing construction may be employed through a head construction contract
61 or a contract for services. A contract for services is used where the client employs trade
62 contractors directly. Alternatively, a hybrid of first-stage services contract and second-stage
63 head contract may be used for 2-stage early contractor involvement 2S-ECI (Finnie, Ameer Ali,
64 Park, 2018; Whitehead, 2009).

65

66 **2. Research methodology**

67 The implied liabilities of contractors entering fixed price contracts are examined in terms of how
68 they may influence interpretation of NZS3910:2013 when deciding claims for design
69 development post-contract signing. A flowchart for aiding claim entitlement decisions is
70 provided. Then head contractor and consultant manager liabilities are compared at common
71 law, with a tabulated comparison of the two.

72

73 While design buildability obligations have been considered for ground conditions and
74 foundations (Dennys and Clay, 2015; Rosenberg, 2012; Bailey, 2007; Walton, 2007), there is an
75 absence of literature specific to detailed design development. Few legal precedents exist, with
76 disputes generally negotiated or referred to adjudication or arbitration where outcomes remain
77 private. Similarly, few precedents exist specifically relating to the construction management
78 procurement pathways where the client employs a CMM. Therefore, cases related to
79 contractor's liability for design buildability are applied through analogy. Similarly, cases related
80 to project managers and contract administrators are considered for CMMs. Legal commentary is
81 also applied from respected textbooks and published papers. According to Chynoweth (2008)
82 analogy is the common tool for legal scholar research and (p30) legal scholarship involves
83 developing 'scholastic arguments for subsequent criticism and reworking by other scholars,
84 rather than any attempt to deliver results which purport to be definitive and final.' This paper is
85 not intended as legal advice.

86

87 **3. Contractor claim entitlement**

88 **5.1 Common law position - Absolute liability and the inclusive price principle**

89

90 The New Zealand Courts have so far followed the UK in holding building contractors strictly
91 liable for design buildability. According to Walton (2007, p210), a NZ barrister, ‘the common law
92 position is that, without an express provision to the contrary, ground condition risk rests with the
93 contractor like any other physical condition or buildability issue.’ The contract administrator must
94 decide whether the contractor should have allowed sufficient costs for the newly detailed work
95 within their fixed price, or whether the detailed work is sufficiently different to constitute a
96 variation to the contract. The distinguishing point is that the contractor should have included for
97 all costs necessary to complete the works, even if not specified on the drawings. This is the
98 ‘*inclusive price*’ principle. If the drawing is considered within the contractor’s *inclusive price*, it
99 may be instructed as a variation ‘for the contractor’s convenience’ without additional time or cost
100 (see Dennys and Clay, 2015, p402). Though, the extent of application ultimately depends on the
101 interpretation of the contract and specified scope (see Dennys and Clay, 2015, 3-064).

102 Therefore, the contractor may not automatically be entitled to costs of additional materials
103 shown in detailed drawings instructed after contract signing. The contractor’s absolute liability is
104 not necessarily reduced by the client providing a schedule of quantities. While the contractor
105 may rely on the accuracy of the SOQ aligning with the drawings (unless the SOQ disclaims
106 liability), this may not reduce the contractor’s absolute liability for unforeseen circumstances. In
107 *Workshop Tarmacadam v Co Ltd Hannaby (1995)* a contractor’s claim for additional quantities
108 due to encountering hard rock was rejected, despite the contract containing a re-measurement
109 clause. Russell LJ said it would have been the ‘easiest thing in the world’ for the plaintiffs to
110 make a specific provision for dealing with ‘unforeseen conditions being encountered’, had they
111 chosen to. The main relief at common law is if the contract becomes impossible or radically
112 different (frustrated).

113

114 The case of *Wilkinson and Davies Construction Co Ltd v Geraldine Borough (1958)* provides an
115 example of a building contractor being held liable for both the original and re-design of a
116 concrete tank chamber after the original design was abandoned midway through construction.

117 The contractor argued that a contract for sinking a sewage tank became wholly inapplicable
118 after uncovering ground conditions that made excavation impossible and the designed pump
119 system (44 gallon or even 400-gallon drum) unworkable due to the volume of ground water, so
120 not buildable as designed. However, the High Court in Wellington, followed the UK case of
121 *Tharsis Sulphur and Copper Co Ltd v M'Elroy and Sons* (1878). in finding the contract was not
122 frustrated because performance remained possible. The tank could still be constructed albeit
123 using the different design methodology involving craning precast rings under water with a diver.
124 The contractor was therefore held to their contract obligations. In *Tharsis*, the contract specified
125 girder dimensions and, without written instruction to make the girders of thicker metal, the
126 contractor could not recover extra costs. Lord Blackburn stated that 'When in this case, the
127 contractor says 'We cannot do the works as we have promised to do it unless you permit us to
128 make it thicker than we undertook to make it' and the engineer on behalf of the company says 'I
129 will not object to your making it thicker if you cannot do it otherwise', I think there is nothing in
130 that to imply that there was to be payment for the additional thickness.'

131

132 Other examples of NZ courts applying a strict liability include *Slowley v Lodder* (1900) and *The*
133 *Power Co Ltd v Gore District Council* (1997). In *Slowly* the Court of Appeal followed *Thorn* in
134 finding that a local council owed no implied warranty against known latent defects, after a
135 previous contractor packed above a tunnel with brushwood and logs following a previous slip.
136 This led to a tunnel collapse when the new contractor carried out work. Instead, contractors
137 should make their own inquiries. *The Power* demonstrates parties' freedom to contractually
138 agree their own risk allocations. A contract to supply power to the council for 1 penny per unit
139 for time hereafter, was upheld on the basis contracts are not frustrated just because they turn
140 out to be bad bargains.

141

142 The long established principle is that the client who provides drawings to the tenderer does not
143 warrant that the design is buildable (Bailey, 2007). Rather, it is the contractor who by submitting
144 a fixed price, legally warrants that they can build what has been designed and do so for their
145 price, even if unforeseen events make performance more difficult, including buildability
146 problems arising from engineer's negligent design (Rosenberg, 2012, p16). *Thorn v London City*

147 *Council* (1876) is another early UK case where the contractor was held to an *absolute liability*
148 for design buildability when caissons failed to support the water pressure. Rosenberg (2012)
149 confirmed that both *Thorn* and *Tharsis* remain good case law. Building contractors align with
150 product manufacturers in that both must deliver a fit for purpose, defect free product (Burrows,
151 Finn and Todd, 2012). The principle of *absolute liability*, first established in *Paradine v Jane*
152 (1647) dictates that, by entering a contract to absolutely do something, the provider must do that
153 thing regardless of anything making the task more difficult (as opposed to a mere promise). As
154 an absolute liability, the client does not first have to establish negligence as they might with a
155 contract for services.

156

157 For design development, the contract administrator must decide to what extent the contractor
158 should have allowed for within their fixed price to compensate for incomplete drawings (*inclusive*
159 *price principle*). While no clear legal definition of design 'buildability' exists (see Benaim v
160 Davies, 2005), Rosenberg (2012, p2) suggests the following definition of 'buildability design risk'
161 incurred by contractors, being the allocation of:

162

163 deficiencies in the permanent works design which make it more time consuming or
164 costly (or even impossible) during the construction phase to build to the specifications
165 and drawings.' (Underlining by author).

166

167 This suggests that the contractor must include sufficient costs to complete the works, including
168 the for the permeant building works. NZS3910:2013 clearly requires contractors to allow for
169 costs both temporary permanent, whether specified or 'inferred' from the contract.

170

171 NZS3910:2013 Clause 5.1.1 General responsibilities

172 In carrying out the Contract Works the Contractor shall complete, handover to the
173 Principal, and remedy defects in the Contract Works and provide all services, labour,
174 Materials, Plant, Temporary Works, transport, and everything whether of a temporary or
175 permanent nature required so far as the necessity for the same is specified in, or is to
176 be inferred from the contract. (Underlying by author)

177

178 Under NZS3910:2013, Contractors may be entitled to costs for drawings when they are
179 instructed to resolve matters relating to *9.5 Unforeseen physical conditions* or *5.13 Underground*
180 *and above-ground utilities*. However additional costs may be deemed within the contractor's
181 *inclusive* price when the drawings are instructed in response to the contractor's request for
182 greater detail or a change to suit their methods.

183

184 **SCENARIO: Under NZS3910:2013 Clause 5.1.1, the contractor is deemed to have included**
185 **all costs required to complete the works, both of a temporary and permanent nature,**
186 **including work specified in, and inferred from, the contract. Including for all works of a**
187 **'permanent' nature indicates that contractors must allow sufficient costs to compensate**
188 **where details may be lacking. Ultimately, the contract administrator must consider**
189 **whether the instructed detail is sufficiently similar in nature to be deemed included in the**
190 **contractor's fixed price or different enough to constitute a contract variation.**

191

192 **5.2 Extent of the contractor's 'inclusive' fixed price - Work similar or wholly different**

193 The contract administrator may consider the extent of the contractor's inclusive fixed price under
194 three main categories:

195 (i) No entitlement for instructions sufficiently similar in nature to the original scope that the
196 contractor should have allowed for all necessary costs, even if not specifically
197 shown;

198 (ii) Instructions sufficiently different to enable variation claims. According to Dennys and
199 Clay (2015, p403) absolute liability 'will extend to variations, such as extra work,
200 which can be shown to be similar in general character to the contract work but may
201 not extend to unforeseeable variations which are different in character or location';
202 and

203 (iii) Instructions wholly outside the contract itself, which could be refused or performed for
204 rates outside the contract (*quantum meruit*). Dennys and Clay (2015, p649-650)
205 provide how for a single house, the addition of a garage might be acceptable, but a

206 variation to build a second house might not, whereas, in a contract for 300 houses,
207 instruction for another 20 houses might not vitiate the original contract.

208

209 The first two categories may apply where the contractor requests further details. Whereas, the
210 third category is more likely client instructed scope changes.

211

212 **SCENARIO: The contract administrator must decide whether the details are sufficiently**
213 **similar in nature that the contractor should have included the costs within their fixed**
214 **price, or are different enough to constitute a variation. In any case, the administrator**
215 **might ask the contractor what they allowed for to produce a *fit for purpose* product.**

216 **5.3 Whether contractor can claim work outside the contract - frustration and restitution**

217 At common law, the main relief from *absolute liability* is when unforeseen circumstances render
218 performance impossible or radically different from the original contract. The contract may then
219 be deemed *frustrated*, relieving parties of their contractual obligations irrespective of the elect of
220 either party (Dennys and Clay 2015; Burrows, Finn and Todd, 2012). However, the threshold for
221 frustration is generally high and contractors may suffer great loss arising from unforeseen
222 circumstance, such as ground conditions (Burrows, Finn and Todd, 2012).

223 ;p

224 If an instruction was deemed a necessary solution to overcome circumstances that would
225 otherwise frustrated the contract, the contractor may be entitled to claim costs for the work
226 outside the contract rates under the doctrine of *restitution based on unjust enrichment*.

227 However, *restitution* claims are only available when no other avenue exists through contract or
228 tort, and where enrichment of the benefited party at the expense of the other would be unjust
229 (Davenport and Harris, 1997). Restitution is still an evolving doctrine in Australasia. New
230 Zealand courts have not yet 'accorded it the status of a cause of action' (Burrows, Finn and
231 Todd, 2012, p27) and *Pavey and Matthews v Paul* (1987) was the first Australian case to
232 formally apply unjust enrichment. In *Pavey*, a client refused to pay for residential building work
233 on the basis that no contract existed. The work was performed on an oral contract when the
234 Builders Licensing Act 1971 (NSW) required residential contracts be in writing. While this case

235 may have provided clear application of the doctrine, Dean J in *Pavey* cautioned that future
236 judges should not use 'judicial discretion to do whatever idiosyncratic notions of what is fair and
237 just might dictate.' The following scenarios theorise where restitution might apply in construction
238 claims (Davenport and Durham, 2013, p37):

239

240 Example 1 (p37): ground conditions:

241 ...the principal or superintendent refuses to order a variation to overcome some
242 obstacle, eg a defect in the design or a latent site condition. Assume that it is impossible
243 to continue the work specified until the obstacle is overcome. An example may be
244 where the principal has provided a design for footings of a building but the subsoil
245 conditions prove to be such that the design of the footings must be amended or the
246 buildings will be unstable.

247

248 Example 2 (p87): latent structural defects:

249 The specification requires the contractor to replace the tiles on an existing building.
250 When the contractor starts work, the contractor finds some rotten beams that need to
251 be replaced before the tiles can be safely laid. Assume that replacement of beams is
252 not part of the work prescribed by the contract. The owner refuses to direct a variation
253 and tells the contractor that it is the contractor's problem. A contractor must not perform
254 unsafe work so the contractor has the choice of replacing the rotten beams or not
255 proceeding with the work. If the contractor replaces the beams, that additional work is
256 not a variation. It is not work under the contract (underlining by author).

257

258 Both examples involve work required to fulfil the contract. In the absence of express contract
259 provisions, by offering fixed price contracts, contractors adopt the risk of unforeseen
260 circumstances that render performance more difficult, but not impossible or wholly different. This
261 restricts restitution to where the contract becomes frustrated. According to Burrows, Fin & Todd
262 (2012, p815) the threshold for frustration is high (underlining by author):

263 Performance must have become impossible of performance or "totally different"; the
264 obligation must have been fundamentally altered. Anything less will not do. This, as

265 seen, even drastic fluctuations in currency over a period of time do not normally
266 frustrate contracts; nor do very substantial obstructions to the progress of building
267 contracts. Some of this can be justified on the basis of the acceptance of risk by one of
268 the parties. Nevertheless, the hardship caused can be very real and out of proportion to
269 what was envisaged.

270

271 If the contract does provide for such events, then the work is handled within the contract. For
272 example, NZS3910:2013 Clause 5.13 *Underground and above-ground utilities* treats locating,
273 altering or protecting latent utilities as a contract variation. Similarly, Clause 9.5 *Unforeseen*
274 *physical conditions*, treats reasonably unforeseeable physical conditions including artificial
275 obstructions as variations. Davenport and Durham (2013) recommend a catch-all contract
276 clause to avoid restitution claims (such as NZS3910:2013 Clause 5.1.1 General
277 responsibilities).

278

279 In example 2, the contract might be frustrated if replacing roof beams is impossible or
280 represents wholly different scope. If the contract specified replacing a dozen tiles, then replacing
281 most of the roof structure may constitute frustration, whereas, if the contract involved replacing
282 the whole roof, then replacing two rotten roof beams might not.

283

284 **SCENARIO: It is unlikely that the instructed detail could constitute something wholly**
285 **outside the contract scope. NZS3910:2013 contains provisions for Variations including a**
286 **change in type or quantity or materials (9.1), for Underground and above-ground utilities**
287 **(5.13), and Unforeseen physical conditions (9.5).**

288

289 **5.4 Duty to warn**

290 At common law, contractors must warn of design issues that are reasonably foreseeable to
291 contractors similar to that employed. Warning of issues early allows for solutions before costs
292 escalate. NZS3910:2013 Clause 5.1 Advance Notification was introduced in the 2013 version to
293 require:

294

295 5.21.1

296 *The Contractor and the Engineer shall each notify the other in writing as soon as either*
297 *of them becomes aware of any matter which is likely to:*

298 (a) *Materially alter the Contract Price;*

299 (b) *Materially delay completion of the Contract Works; or*

300 (c) *Result in a breach of a statutory duty in connection with the Contract Works.*

301

302 Clause 5.21.3 provides that: 'If the Contractor does not notify of a matter which it reasonably
303 ought to have...' then any variation will be calculated on the basis that they had, and accounting
304 for the impact being avoided or reduced.

305

306 According to Dennys and Clay (2015, p430) the test of reasonable foreseeability is a matter of
307 fact; contractors will not be expected to vet design details of experts, and it will 'only be
308 relatively glaring or obvious design deficiencies judged in the light of the knowledge to be
309 expected from a Contractor of the type employed which will give rise to the duty to warn'
310 (underlining by author). Example cases include:

311 • Failing to warn of serious design faults and safety dangers: In *Plant v Adams* (2000) the
312 court held the subcontractors should exercise appropriate skill, protest vigorously and
313 even walk offsite unless a safe design was produced.

314

315 • Failing to warn of increased costs: A builder in NZ was found liable for failing to warn of
316 increases to their estimate after being repeatedly asked to firm their price by the client
317 (*Abrams v Ancliffe*, 1978). Cook J held that any reasonably careful builder would have
318 warned the client earlier of cost inflation.

319

320 While these cases centre on safety and costs, Craig (1999) commented that the duty imposed
321 in *Abrams v Ancliffe* could be likened to a duty to warn of design defects.

322

323 **SCENARIO: ECI could influence the extent of what is reasonably foreseeable. For**
324 **example, the contract administrator may take a stricter stance on contractors claiming**
325 **variations for requested details if the contractor had greater opportunity to evaluate the**
326 **design through ECI and if their ECI team included qualified Architects and Engineers**
327 **(being the 'knowledge to be expected from a Contractor of the type employed').**

328

329 **5.5 Accuracy and clarity of contract documents**

330 The contractor may be entitled to claim costs for the detail if it is issued to resolve ambiguities in
331 the original documents. The *contra proferentem* principle implies that ambiguities in contract
332 documentation err against the provider of the document. In construction, the principle generally
333 applies to drawings, specifications and specific terms or exclusions, rather than standard terms
334 (drafted with representation across clients, engineers and contractors).

335

336 Recent cases relating to exclusion clauses, suggest that courts are taking a practical approach
337 when considering what constitutes ambiguity, and balancing; the intended purpose and natural
338 interpretation of the clause, commercial bargaining power of the parties and their freedom to
339 contractually agree risk apportionment, leaving *contra proferentem* as a last resort where
340 ambiguity remains (*Drilling UK plc v Providence Resources plc*, 2016). New Zealand appears to
341 be adopting this approach, in that only where the natural and ordinary meaning cannot be
342 ascertained due to genuine ambiguity will *contra proferentem* apply (*Persimmon Homes v Ove*
343 *Arup*, 2017; *Lumley General Insurance v Body Corporate*, 2010).

344

345 NZS3910: 2013 2.7.4 allows variation claims for reasonably unforeseen ambiguities that, after
346 clarification from the Engineer result in additional time or cost. In relation to 2S-ECI, the JCT
347 pre-construction services agreement (PCSA) (JCT, 2018) requires contractors to warn of
348 document inconsistencies and ambiguities ahead of agreeing the construction contract.

349

350 **SCENARIO: Contractors may be able to claim the difference in costs between conflicting**
351 **details across drawings. However, if the contractor installs materials based on**

352 **ambiguous drawings, they may be entitled to the difference in cost between materials,**
353 **but not the cost of removing what was already installed if it is deemed they should ought**
354 **to have notified in advance. If the contractor was involved in design development**
355 **through ECI, the threshold of what is considered reasonably foreseeable may be higher.**
356 **The contractor's bargaining power may also be considered higher when negotiating**
357 **through open-book pricing than through competitive tender.**

358 ***5.7 Designer negligence for 'buildability'***

359 Designers have been found negligent for their designs lack 'buildability' on the basis that
360 designs should not rely on exceptional levels of workmanship in order to comply with Codes
361 unless the level of workmanship is specified, such as for a prestigious hotel (*Department of*
362 *National Heritage v Steensen Varming Mulcahy*, 1998; Dennys and Clay, 2015, 2-063), and that
363 the quality of documentation should be sufficiently detailed and legible to enable construction
364 without further clarification. While this appears at odds with the contractors' strict liability, there
365 is no evidence that this changes the contractor's commercial liabilities when offering fixed price
366 construction contracts for client supplied design.

367

368 Three further cases provide examples:

- 369 (i) Roof lap tolerances were found unlikely to be achieved by ordinary standards of
370 workmanship and ordinary supervision suffice in less extreme conditions. Judge
371 Hicks QC held the designer negligent for not considering trade literature warning
372 about low pitched roofs, and the client's representative negligent for failing to
373 supervise. (*George Fischer Holding Ltd v Multi Design Consultants*, 1998).
- 374 (ii) A front sealed cladding system was held to lack 'buildability' because it relied on a level
375 of 'exceptional skill' - above the 'care and skill ordinarily to be expected', including
376 working in windy conditions and partly from scaffold. It was similarly held that
377 designs may be defective if they incur very difficult supervision, and may be
378 described as lacking 'supervisability'. The contractor was also found liable for
379 breaching an implied term to warn of design buildability issues (*Equitable*
380 *Debenture v William Moss Group*, 1984).

381 (iii) An adhesive-fixed tile cladding resulted in difficulties achieving concrete tolerances to
382 receive the tiles (*Victoria University of Manchester v Hugh Wilson Lewis Womersley*
383 *and Pochin*, 1984). Judge Hewey held that the architects failed to heed tiling
384 literature or properly consider junctions and movement joints and in specifying very
385 small gaps between tiles 'did not have proper regard for buildability.'

386

387 The above cases involved completed buildings that leaked. They did not involve contractors
388 requesting design changes on the basis they could not otherwise build what was designed. Also
389 both *Equitable Debenture* (1984) and *George Fischer* (1988) involved design and build
390 contractors, meaning the client did not provide the contractor with the design. Instead the clients
391 sued the designers who in both cases had provided collateral warranties directly to the clients.
392 In *George Fischer* (1988) the design and build contractor went into liquidation at the start of the
393 trial.

394

395 Interestingly, in NZ, The Building Amendment Act (2013) s.362 (l) requires that materials for
396 residential building work be '*suitable for the purpose*' and workmanship be performed using
397 '*reasonable skill and care*'. However, this only applies to residential building contracts over
398 \$30,000.00 for household units. Whereas, NZS3910:2013 is typically used for commercial or
399 infrastructure works.

400

401 A designer in New Zealand was found negligent for, among other things, their design lacking
402 "buildability" (Building Performance, 2016) under the Licensed Building Practitioner (LBP)
403 scheme which came into effect in 2007 and requires all designers and residential building
404 practitioners to be licenced. The Board cancelled the designer's licence and ordered them to
405 pay costs for incompetence and disrepute after the designer failed to carry out adequate site
406 investigations, varied a producer statement from a previous project, and their design was found
407 to be incomplete with hand drawn notes that were deemed illegible and lacking sufficient detail
408 to prescribe how the building was to comply with the New Zealand Building Code (NZBC). The
409 Board noted that:

410

411 ...a designer's plans should be able to stand by themselves, should not require
412 clarification, and should document how the building work is to be undertaken so that
413 code compliance is achieved. The Board has also consistently conveyed in previous
414 decisions the message that it is not appropriate for licensed building practitioner
415 designers to use the building consent process as a peer review or quality assurance
416 mechanism and/or rely on the building consent authority to pick up any anomalies in the
417 design documents.

418
419 The Senior Technical Advisor agreed that contractors may incur a strict commercial liability for
420 buildability when tendering fixed price contracts, but clarified that the LBP Board take a holistic
421 approach to 'accountability' based on the reasonable standard they expect of Licensed
422 Designers. This, therefore, differs from 'an implied guarantee of buildability and the subsequent
423 liability to compensate for the problems experienced – of which the Board would have no
424 comment' (personal email communication, 15 December, 2016).

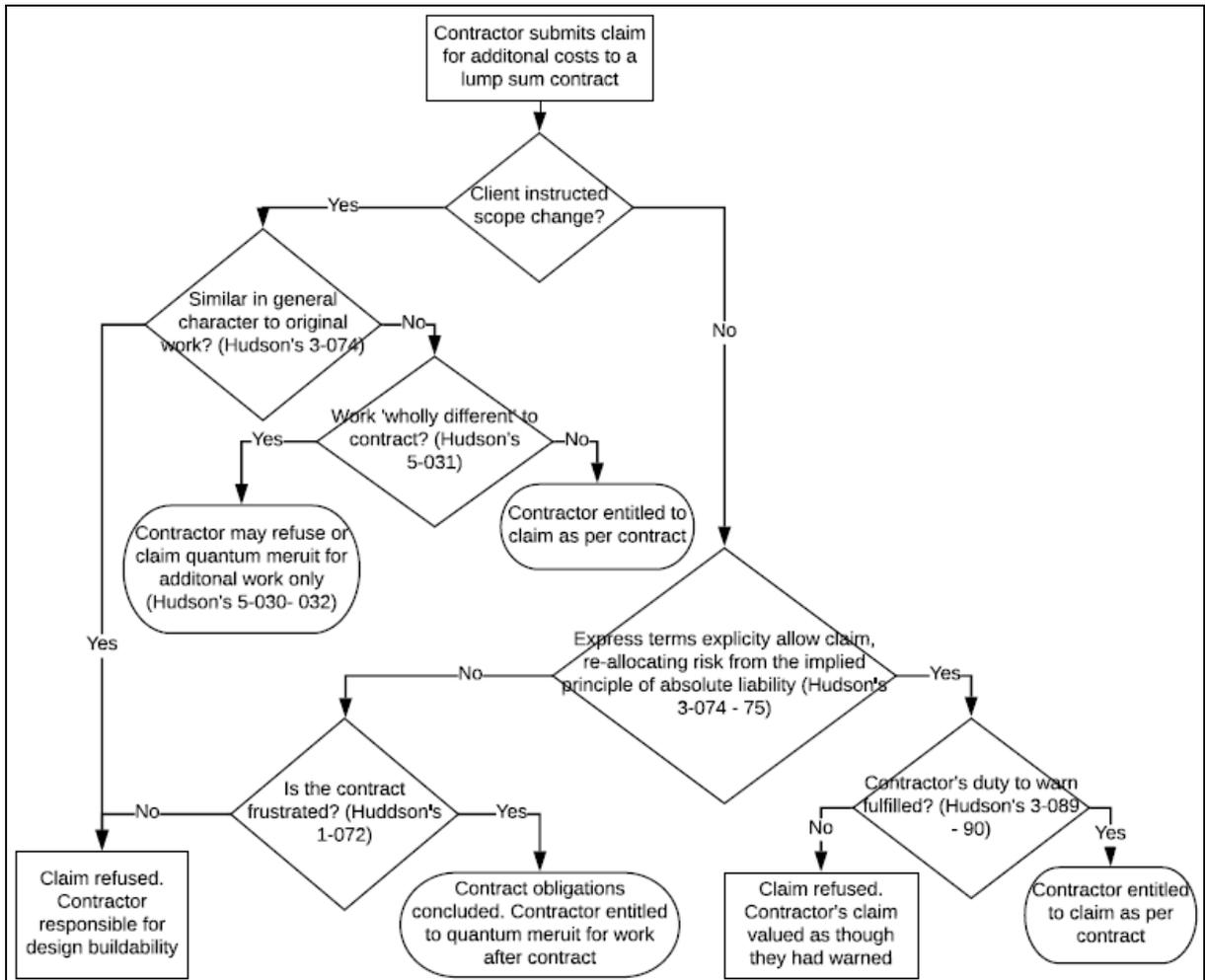
425
426 Based on the above, contractors remain liable for the costs of design solutions when they
427 request these after entering a fixed-price contract for design supplied by the client. Separately,
428 Licensed Designers may be accountable to the LBP Board (and possibly ordered to pay costs) if
429 their design is deemed negligence based on such breaches as insufficient investigations or
430 illegible and inadequately detailed drawings. Courts may also deem designers negligent if their
431 designs rely on exceptional levels of workmanship in order to comply with the Building Code, as
432 supported by the Building Amendment Act requirements for residential building contracts over
433 \$30,000.00 for work involving household units.

434

435 **5.8 Claim entitlement flowchart**

436 Figure 1 provides a decision flowchart summarising the key considerations when evaluating
437 claims related to design buildability. Decision gateways are referenced to the authoritative
438 *Hudson's Building and Engineering Contracts* (Dennys and Clay, 2015). This demonstrates two
439 main grounds for claims:

- 440 • Instructed details sufficiently different in character from the original scope to constitute a
- 441 contract variation, so long as contractor has not breached their implied duty to warn
- 442 • Instructions wholly different to the original scope or the contract is frustrated when
- 443 unforeseen events render performance impossible or wholly different.
- 444



445
446 **Figure 1:** Decision-matrix for determining contractor claim entitlement

447
448 **6 Effect if consultant manager (no head contractor)**

449 Consultant construction managers (CMMs) are employed under the *construction management*

450 procurement model. The client employs the CMM to act as their representative in planning and

451 administering the works under a contract for services, sometimes call a construction

452 management agreement (CMA), with the client employing the trade packages directly (no head
453 contractor).

454 **6.1 Duty of care**

455 CMMs have a lesser duty than head contractors. CMMs provide professional services, unlike
456 contractors who are deemed to deliver a product. As such, CCMs do not guarantee project
457 outcomes, only that they will take *reasonable skill and care*. For example, head contractors may
458 incur damages for delay by their subcontractors, whereas, clients might rely on their CMM to
459 apportion damages to individual trade contractors or otherwise establish that late completion
460 was resultant of the CMM's negligence. The test of professional conduct was established in
461 *Bolam v Friern Hospital Management Committee* (1957) and extended to other professionals
462 who, like doctors, cannot guarantee successful operations. The test of what is *reasonable skill*
463 *and care* is measured in terms of what any other reasonably competent professional would have
464 done given similar circumstances, anything less may be deemed negligent (Monastiriotis and
465 Bodnar, 2013).

466

467 **6.2 Procuring trade packages**

468 However, what is considered 'reasonable' of CMMs is yet to be fully tested in terms of scope
469 and strictness. For example, *Great Eastern Hotels v John Laing Construction Management*
470 (2005), the first case involving a CM agreement (Keating Chambers, 2018), held that CMMs
471 must avoid gaps when procuring sub-trades. The strict outcome has been compared to a
472 contractor's fitness for purpose warranty (O'Carroll, 2006).

473

474 **6.3 Duty to warn**

475 CMMs provide services like PMs, Architects or Engineers in representing their clients and
476 administering projects. A key duty is keep their client informed and protected from foreseeable
477 risks, such as warning about the following; non-performance by others in the project team
478 (*Chesham Properties v Bucknall Austin*, 1996); tendering packages of substantially incomplete
479 design (*Plymouth & South West v Architecture, Structure & Management*, 2006); recommending

480 clients obtain adequate insurances to sufficiently cover potential damages (*William Tomkinson*
 481 *and Sons v Parochial Church Council*, 1990); ensuring contractors have adequate insurances in
 482 place (*Pozzolanic Lytag v Bryan Hobson*, 1999); ensuring scope of works are not under-
 483 estimated (*Ralphs v Francis Horner*, 1987); budgeting for inflation costs (*Nye Saunders and*
 484 *Partners v Bristow*, 1987); advising about contractor reliability (*Pratt v George J Hill Associates*,
 485 1987); serving notice on contractors in serious breach of their obligations to maintain progress
 486 (*West Faulkner Associates v Newham*, 1995). In doing so, they must act persuasively. It
 487 insufficient to simply act as a 'post box' (Gould, 2011; *Royal Brompton Hospital v Hammond*,
 488 2001).

489
 490 The extent that PMs or CCMs should warn of design documentation problems is less clear. PMs
 491 should ensure that other team members satisfy their obligations. However, this may not extend
 492 to ensuring the correctness of their decisions (*Royal Brompton Hospital v Hammond*, 2001).
 493 Otherwise, PMs would effectively be doing everyone else's work (Gould, 2011). This indicates a
 494 lower level duty to warn about detailed drawing matters than contractors, Engineers or
 495 Architects who are likely more intimately involved in the drawings.

496

497 **6.4 Application of CCM obligations**

498 Both contractors and consultants typically provide services in the first stage of 2S-ECI. Then,
 499 CMMs provide services through the construction stage, while head contractors adopt a strict
 500 liability for project outcomes when they enter fixed price construction contracts. Contractors'
 501 strict liability includes the work of their subcontractors and coordination and connectivity
 502 between trades. Whereas, CCM's may instruct individual trade contractors to manage
 503 connectivity, on the client's behalf. Instructions for extra blocking, fixings, flashings and sealants
 504 may involves say three different subcontractors (Carpentry, Cladding, and Sealants). Table 1
 505 summarises key comparisons.

506

507 **Table 1:** Summary comparison of head contractor and CCM obligations

Obligation	Head contractor	Consultant manager
Construction	Absolute liability and fitness for purpose.	Reasonable skill and care for planning and

	NZ Building Act stipulates reasonable standards of workmanship and fit for purpose materials for residential work.	managing construction work on behalf of the client who employs trade packages directly. (Section 6.2)
Duty to warn	<p>Duty through tort to warn of design compliance issues or cost increases after providing a budget. (Section 5.4)</p> <p>Test of foreseeability based on facts, and what any other reasonably competent similar contractor would have foreseen. (Section 5.4)</p> <p>ECI may influence foreseeability threshold in terms of time afforded and ECI team composition. (Section 5.4)</p>	Duty to warn of contractual risk and non-performance by team members, taking reasonable skill and care. (Section 6.3)
Procurement	Absolute liability for procuring all necessary work (inclusive price principle). (Section 5.1)	Procure all works necessary without gaps, so far as not negligent. (Section 6.2)
Time	<p>Absolute liability.</p> <p>Client can charge liquidated or general damages for late completion except for extension of time grounds permitted in the contract. (Section 5.1)</p>	Client relies on consultant apportioning damages to applicable trade packages, or must demonstrate that damages are consequential of the consultant's negligence. (Section 6.4)
Quality	<p>Absolute liability. Contractor responsible for remedying defects at their expense. (Section 5.1)</p> <p>Contractor may request that instructed drawings will comply with the Building Code when building using reasonable levels of workmanship (Section 5.7)</p>	Client relies on consultant apportioning remedial work to individual trade-packages, or must demonstrate the defects are consequential of the consultant's. (Section 6.4)
Cost	Held to fixed price, except for contractual compensation events, sufficiently different instructions, document ambiguities, or frustration. (Sections 5.1 – 5.5)	Reasonable skill and care when providing a budget. (Section 6.1). Must warn of cost increases. (Section 6.3)
Instructed drawing details	<p>Contractor incurs absolute liability for instructions similar in nature. Contract administrator respond to claims for instructed drawings by enquiring what the contractor allowed within their fixed price to produce a fit for purpose product. (Section 5.1)</p> <p>Contractor may claim variation costs for instructions sufficiently beyond the original scope. (Section 5.2)</p> <p>Contractor may refuse instructions wholly different to the original scope or perform work outside contract rates (Section 5.2)</p> <p>Contractor may claim cost difference for ambiguities in drawings under <i>contra proferentem</i>. (section 5.5), but not the cost for removing incorrect materials if they reasonably ought to have warned in advance (5.4 and NZS3910:2013, 5.21.1)</p>	May enforce inclusive price principle to individual trade-packages, though does not adopt an overall absolute liability for connectivity like a head contractor. (Section 6.4)

509 **SCENARIO:**

510 **A Carpentry subcontractor is unlikely responsible for integration with the cladding**
511 **system, instead relying on the head contractor's methodology. For example, in *Aurum v***
512 ***Avonforce* (2001) a subcontractor was deemed not liable for a partial excavation**
513 **collapse, because they could not know the DB contractor's method of work. CCMs could**
514 **argue the *inclusive price* principle against individual subcontractor claims, such as the**
515 **Carpentry contractor requesting details of fixings. Though calling an instruction that**
516 **details extra work, a 'variation for the contractor's convenience' could be a hard sell. The**
517 **client may claim negligence of the CMM if they can demonstrate that the instruction**
518 **resulted from the CMM failing to procure trade packages or that they failed to warn of**
519 **foreseeable design problems. Unlikely for a construction detail.**

520

521 **7. Conclusions**

522 Key considerations for determining whether instructed detailed drawings vary the contract under
523 NZS3910:2013 when instructed post contract signing, were found to include:

- 524 • Whether the detail is within what the contractor should have allowed for within their
525 fixed price to compensate for any lacking details, including works of both a temporary
526 and permanent nature (*inclusive price principle* and NZS3910:2013, 5.1.1).
- 527 • Whether the instruction details work that is different enough to constitute a contract
528 variation, or so wholly outside the original scope to be considered outside the contract
529 itself.
- 530 • Whether the drawing is issued at the contractor's request to suit their construction
531 methodology. Generally, contractors warrant buildability when offering fixed price
532 contracts for client supplied designs. Such instructions may be issued as variations for
533 the contractor's convenience with no additional time or cost. Though NZS3910:2013
534 treats reasonably unforeseeable latent conditions as variations (such as 5.13
535 Underground and above-ground utilities or 9.5 Unforeseen physical conditions).

- 536 • Whether the instruction resolves problems that could have been mitigated had the
537 contractor provided advanced notification (5.21.1). Any resulting variation would be
538 calculated on the basis that the contractor had warned where they reasonably ought to.
- 539 • Whether the instruction resolves drawing ambiguities. The contractor may be paid the
540 difference between two products on the basis of *contra proferentem*. NZS3910:2013,
541 2.7.4 treats reasonably unforeseeable ambiguities as variations. The threshold for
542 foreseeability may be deemed higher where the contractor was involved in design
543 development through ECI.

544

545 Design buildability responsibilities were also considered for designers through case law and the
546 NZ LBP scheme. While designers may have responsibilities for insuring their designs are
547 sufficiently detailed to comply with Building Code when built using reasonable levels of
548 workmanship, this does not appear to change the commercial liabilities contractors face when
549 entering fixed-price construction contracts.

550

551 Implied duties of contractors and CCMs were compared at common law. Both provide services
552 in the first stage of 2S-ECI taking *reasonable skill and care*. During the construction stage,
553 CCMs continue to provide a project management and administration services, whereas, head
554 contractors adopt a more absolute liability to deliver a defect free product with single-point
555 responsibility for all work including that of subcontractors and including for connectivity. The
556 benefit of single-point accountability should perhaps be balanced in terms of, for example,
557 CCMs acting on behalf of their clients to reduce contractor claims rather than head contractors
558 claiming against their clients.

559

560 In the absence of an implied body of opinion, the actual scope of CCM obligations depend on
561 the written services agreement. Construction management agreements (CMAs) should carefully
562 consider the scope of work, such as planning and procuring a comprehensive set of trade
563 packages without gaps, administration, and warning of contractual issues such as cost
564 increases and insurances, non-performance by other team members, and whether reviewing
565 designs.

566

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672 **Figure captions (images as individual files separate to your MS Word text file).**

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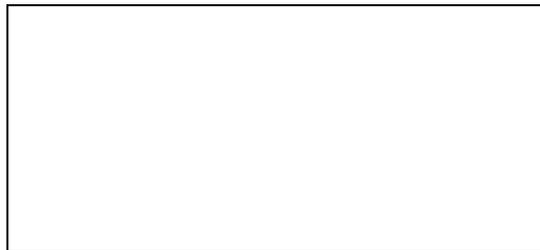
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681 Figure 1. Claim entitlement flowchart

682 Table 1. Summary comparison of head contractor and CCM obligations

683

684



Design development post contract signing - client or contractors cost?

	Reviewer feedback	Responses:
	Reviewer #1	
1	<p>The article has not improved. There is no clear aim or purpose. Objectives are unclear- there is consequently no progress. It reads more like a series of notes restating well known material and the authors do not seem to know how to reference, or reference legal points.</p>	<p>The paper has now been re-written for clarity. Admittedly, the purpose, objectives and structure of the paper were previously unclear.</p> <p>The lead author acknowledges the considerable time and effort of the Reviewers in shaping this paper.</p> <p>The purpose and objectives of the paper have been stated in the beginning of the Introduction as recommended by Reviewer #5.</p> <p>Some sections have been moved to improve the flow of the paper, and the whole paper has been refined for clarity.</p>
2	<p>There is nothing original about this paper, nor do I consider that its content contributes to the development of any aspects of law or practice in the industry. Although it may not be a legal article its substance shows it purports to be one, and to comment authoritatively on the law- and as it fails on this basis alone, I could not approve this for publication, as it is unclear.</p>	<p>The lead author has 7 years of experience operating as a contract administrator for what is now New Zealand's largest construction company. From the Author's experience, the NZ industry has always struggled with evaluating entitlement of design buildability claims. Now in the role of academic, the Author often responds to questions from industry about buildability claim entitlement. This paper forms part of a larger research project into early-contractor involvement. Based on interviews with client, PMs, architects and PQS across New Zealand, there is a clear lack of understanding in this area. The findings of these interviews are the subjective of a separate research paper already accepted for the PAQS 2019 International Congress. The Lead Author now has a nationwide network awaiting publication of this paper, including major professional bodies.</p> <p>The Introduction now more clearly addresses the lack of empirical evidence specifically relating to instructed design development post contract signing, with most disputes being settled privately.</p> <p>The Introduction also more clearly demonstrates that claim entitlement decisions are made by contract administrators who generally lack specialist legal training of implied contract terms.</p> <p>As a big picture, this paper is intended towards making construction contracts clearer to their users in order to reduce ambiguity (and therefore risk) and subsequently reduce disputes (and the need for lawyers!).</p> <p>This paper certainly does fall somewhere between the Law and Management categories. Perhaps categorising under Management, may better attract the intended audience (PMs, architects, PQS). Will leave the decision with the Editor.</p>
3	<p>At 51 'A legal scholar approach is applied to examine how contractual obligations are likely to be 52 interpreted and enforced under NZ legislation in the context of a claim scenario,'</p>	<p>Early contractor involvement is relevant to the objective (iii). The section introducing ECI was moved to its own separate section following Reviewer 1's prior feedback that the original Introduction section was too long. This has now been condensed back into the last paragraph of the Introduction.</p>

	<p>It says lines 47-8 'This article sets out to address; whether the variation claim should be accepted; effect of involvement in design development; effect if claimed from a building subcontractor to a consultant construction manager (CCM) (i.e., no head contractor).</p> <p>But the first thing it does is discuss 'Early Contractor Involvement'</p>	
4	<p>E. g., 85 'Clients do not warrant that the design provided to contractors is buildable (Bailey, 2007) nor that 86 bills of quantities are accurate (Murdoch and Hughes, 2008).'</p> <p>The above references are generalisations, and are not primary authorities for the propositions. Both the above texts referred to are old versions- e.g., it is now Murdoch, Champion and Hughes 2015</p>	<p>This is a well-established legal position. Bailey (2007) provided a number of legal case references to validate this. The lead Author could include many case law references to support this. The effect will not change, and the journal article is restricted to a maximum word count.</p> <p>The point about SOQ's could have been misleading without proper content, and has been clarified as follows:</p> <p>The contractor's strict liability is not necessarily reduced by the client providing a schedule of quantities. While the contractor may rely on the accuracy of the SOQ aligning with the drawings (unless the SOQ disclaims liability), this may not reduce the contractor's absolute liability for unforeseen circumstances. In <i>Workshop Tarmacadam v Co Ltd Hannaby</i> (1995) a contractor's claim for additional quantities due to encountering hard rock was rejected, despite the contract containing a re-measurement clause. Russell LJ said it would have been the 'easiest thing in the world' for the plaintiffs to make a specific provision to deal with 'unforeseen conditions being encountered', had they chosen to.</p>
5	<p>'Early warning provisions have featured in the NEC contract from the beginning (Klein, 2017)'</p> <p>the provisions are in the contracts-they should be citing the authors of the contract -not Klein! He is not the authority for this.</p>	<p>This was never about establishing an authority. The mention of NEC simply provides a comparison to the approach taken in NZS3910:2013. Klein (2017) simply provides further reading about NEC about this which may be of interest to readers. The reference to NEC and Klein (2017) removed.</p>
6	<p>151 ' SCENARIO: This reinforces the Engineer's position that detailed drawings issued, do not</p> <p>152 necessitate additional payment, and could instead be instructed as a 'variation for the</p> <p>153 contractor's convenience.' The contractor's price becoming unprofitable (bad bargain)</p> <p>156 4.2 Level of workmanship (reasonable versus exceptional)</p> <p>157 The contractor may have some argument against absolute liability if a defective building is</p> <p>158 finished and the Architect's design relied on exceptional levels of workmanship in order to</p> <p>meet</p> <p>159 code compliance.'</p> <p>How does 156 connect with the previous 153 or 4? There is no clear development of arguments or positions.</p>	<p>Section 5.7 has been changed to: Designer negligence for 'buildability'</p> <p>A case of a designer found negligent under the NZ Licensed Building Practitioner (LBP) scheme has also been added, with supporting commentary from the Senior Technical Advisor.</p>
7	<p>'according to Dennys and Clay (2016, p430) some contract clauses may be inconsistent with the</p> <p>214 implied legal duty to warn.'</p>	<p>This reference to Dennys and Clay was simply to highlight that prior literature identified the potential for express contract clauses to not clearly align with implied common law position (key point of the paper). Then the actual interpretation of NZS3910:2013 Advanced</p>

	<p>A 2001 case is given as an authority! Proper citations should be given. There are indeed, legal tests regarding the duty to warn, as well as for what is reas. foreseeable.</p>	<p>Warning provisions is examined. The paper also considers effect of contractor involvement in design development and composition of their ECI team, something not previously researched.</p> <p>The reference to Denny and Clay has been removed and a clearer example provided in the Introduction.</p> <p>No case was provided as an absolute authority specifically relating to design development post contract signing. The paper applies cases through analogy to provide key considerations when evaluating claim entitlement.</p> <p>The reference to Aurum v Avonforce (2001) was similarly to simply highlight that prior literature suggests that this area of law is still evolving and NOT definitive. It is certainly not an authority for evaluating contractor claims for detailed design development post contract signing. How could it be!? What is reasonably foreseeable to a contractor on a construction project comprising possibly hundreds of drawings, and taking account of any contractor involvement in the design development, and composition of the contractor’s ECI team is always going to be a difficult area. These are areas not previously considered in research. The paper highlights key considerations.</p> <p>The reference to Aurum v Avonforce (2001) has been removed.</p>
8	<p>Spelling needs attention 254 'The contra proferetem principle' and 262 'parties to contractually agree risk apportionment, leaving contra proferntum'</p>	<p>Spelling corrected. This would, no doubt, have been picked up the typist editor.</p>
9	<p>264 'NZ law in that only where the natural and ordinary 264 meaning cannot be ascertained due to 265 genuine ambiguity will contra proferentum apply (Lumley General Insurance v Body Corporate, 266 2010).</p> <p>They have not considered the implications of relevant major developments in the law since 2010 e.g., Persimmon Homes v Ove Arup [2017] EWCA CIV 373; Executors Ltd v QBE Insurance (International) Ltd [2014] NZCA 447[2015] 2 NZLR at [132], and Tower Insurance Ltd v Skyward Aviation 2008 Ltd [2014] NZSC 185, [2015] 1 NZLR 341 at [32].</p> <p>273 'SCENARIO: In context of design details, it appears that contra proferetem may be 274 considered a last resort after taking a practical approach to interpretation, and 275 considering the overall intent, and parties' bargaining power. Both foreseeability and 276 bargaining power may be influenced by relational procurement systems such as 2S-ECI. 277 This modern stance potentially reduces the contractor's ability to claim for document 278 inconsistencies.'</p> <p>The above is not a scenario. It does attempt to provide an appraisal of the role of the contra preferentum doctrine</p>	<p>The focus of the article is on entitlement of design buildability claims relating to detailed design development. The paper does not propose any definitive outcome on contractor claims.</p> <p>It is clear (including from Reviewer 1’s comment) that there is an absence of any authoritative law specifically relating to buildability claims for construction contracts. The authors reviewed a number of legal cases relating to contra proferentem. The cases listed by Reviewer 1 are still all relating specifically to exclusion or indemnity clauses mostly for insurance.</p> <p>A well-established problem in construction has been contractors competitively bidding low, then aggressively claiming any inconsistencies in design documentation. Many references could support this.</p> <p>The general implication as suggested in the paper, is that a more practical approach may be taken where wider considerations may be taken into account by contract administrators such as relational aspects and the extent of contractor involvement in the design development. The cases listed by Reviewer 1 could hardly be deemed to add any ‘major developments’ specifically relating to detailed drawings being instructed post contract signing. For example, the following commentary on Persimmon Homes v Ove Arup [2017]:</p> <p><i>‘Finally, Persimmon Homes is yet another decision in which the Court of Appeal has expressed its view on the limited use which can be made of the contra proferentem rule when construing exclusion</i></p>

		<p><i>clauses in commercial contracts.4 To the extent that the rule remains of any use, it is only as a last resort where consideration of the ordinary meaning of the words and commercial context have not yielded a result. It serves no purpose where the words and meaning of the exclusion clause are clear.'</i></p> <p>https://www.incegdllaw.com/en/knowledge-bank/there-s-nothing-special-about-exemption-clauses-persimmon-homes-v-ove-arup</p> <p>Reference to Persimmon Homes v Ove Arup [2017] added n paper.</p> <p>This was substantiated in the paper in terms of the effect of NZS39910:2013 Advanced Warning provisions and contractor involvement in design development, something not considered in any prior research.</p> <p>Reviewer 1 does not offer any contrasting position.</p> <p>The conclusion to the section has been clarified as follows:</p> <p>SCENARIO: Contractors may be able to claim the difference in costs between conflicting details across drawings. However, if the contractor installs a material or system where drawings showed inconsistencies, they may be paid the difference in costs between systems, but not the cost of removing what was already installed, if it is deemed that they should have foreseen the problem and provided advanced notification.</p> <p>If the contractor was involved in design development through ECI, the threshold of what is considered reasonably foreseeable may be higher. The contractor's bargaining power may also be considered higher when negotiating through open-book pricing than through competitive tender.</p>
10	<p>306 'A potential avenue exists for contractors to claim outside the contract through restitution based</p> <p>307 on unjust enrichment. This provides a basis of claims, where no other avenue exists through</p> <p>308 contract or tort, and where an exchange of value occurred where enrichment of the benefited</p> <p>309 party at the expense of the other, would be unjust (Davenport and Harris, 1997). However,</p> <p>prior</p> <p>310 literature on the scope of restitution may conflict with principles of absolute liability</p> <p>and the</p> <p>311 inclusive price principle.'</p> <p>Again terms, doctrines need to be accurately defined, with uptodate referencing.</p> <p>366 'SCENARIO: Frustration and restitution would only apply if the instructed details were</p> <p>367 wholly different to the original contract.</p> <p>368 4.7 Interpretation of express contract terms</p> <p>369 Standard form contracts may specify the general scope of variations and provide pricing</p>	<p>Again Reviewer 1 offers no contrasting position.</p> <p>Section 5.3 has been re-titled: Whether contractor can claim work outside the contract - frustration and restitution</p> <p>The section considers under what circumstances instructed details may be considered 'outside the contract.'</p>

	370 procedures. For example, NZS3910 Clause 9.1 provides that the: The section makes no sense...	
11	There are spelling mistakes in 406 Figure 1 and Hudson is a commentator not not authority for the law- that is case law and legislation	Spelling corrected. This would, no doubt, have been picked up the typist editor. Hardly a reason to reject the paper.
	A duty to warn is started at 206 then stopped at 252 and then resumed at 430- why? It remains unclear. The material needs on overhaul and logical organisation.	Section 5.4 considers the contractors' duty to warn. Section 6.3 considers a consultant managers' duty to warn.
12	The supposed conclusions at 484 do not clearly relate or connect to 46 'This article sets out to address'..... This authors may benefit from a ghost writer	Reviewer comments should provide constructive feedback in terms of how the paper may be improved, and avoid subjective attacks such as Reviewer 1's 'ghost writer' comment. That said Reviewer 1's comments have been acknowledged toward the paper now reading more clearly.
13	There is certainly insufficient law or legal discussion to justify the conclusion at 514 'While focusing on the NZ jurisdiction, with examples drawn from the Building Act 2004 and 515 NZS3910:2013, NZ case law has followed English common law in this area, so findings are 516 useful across common law jurisdictions.'	The context application was widened based on a previous reviewer's suggestion that the paper may be of more interest is expanded to other jurisdictions. The context has now been clearly narrowed to New Zealand legislation and contracts.
	Reviewer #4:	
14	Reviewer #4: For authors have made an excellent effort to address the comments from reviewers systematically. There are 2 areas that the authors could consider for improvement. There is no reference to the context in either the title and the abstract, which could be addressed with minimal effort. Also given the atypical structure of the paper which contains legal analysis of 'scenarios', it would be advisable add a section with the introduction describing the structure of the paper, and this would undoubtedly improve the accessibility and readability of the paper.	The paper is very much improved thanks to the feedback of Reviewers. The title is changed to: Design development post contract signing - client or contractors cost? The context has now been clearly narrowed to New Zealand legislation and contracts. The purpose and objectives of the paper have been stated in the beginning of the Introduction. Some sections have been moved to improve the flow of the paper, and the whole paper has been refined for clarity.
	Reviewer #5:	
15	Abstract It would be helpful if the Abstract identified the Form of Contract and the assumptions made as to the type of contract being considered. It would appear that the paper is restricted to considering Fixed Price Contracts and, I think, Design & Build Contracts since there is later reference to being responsible for providing a product which is 'fit for purpose'. It would also appear that the paper relies on the NZ Building Act for its conclusions or at least some of those conclusions. If the paper relates to legislations other than that of NZ it	The title is changed to: Design development post contract signing - client or contractors cost? Form of contract NZS3910:2013 and lump sum contract is added to the abstract. Note that fitness for purpose obligations do apply for contractors for construction only contracts. If the contract were silent, then the contractor would adopt this implied fitness for purpose obligation for design also. This may incur problems around obtaining professional indemnity insurances (see Do Design and Build Insurance Policy Wordings Fit the Bill? By Jeffrey Brown, published by the Society of Construction Law UK.

	<p>would be helpful to identify at the start of the paper where and how this paper applies.</p> <p>It would also be helpful if the Abstract set out the specific aims of the paper which are presently found at line 46 of the Introduction.</p>	<p>The reference in conclusions to wider application beyond NZ has been removed.</p> <p>The aims at line 46 were already included in the abstract. They are now enumerated to better highlight.</p>
16	<p>If the specific aim of the paper cannot be expressed in the Abstract, then it would be helpful if it were stated at the very beginning of the Introduction rather than at lines 46 so that the reader can understand where he or she is being led through the paper.</p>	<p>The aims at line 46 were already included in the abstract. They are now enumerated to better highlight.</p> <p>The purpose and objectives of the paper have been stated in the beginning of the Introduction.</p> <p>Some sections have been moved to improve the flow of the paper, and the whole paper has been refined for clarity.</p>
17	<p>Regarding clarity of intentions, line 2 states that 'Assessing design buildability risk is crucial for contractors in New Zealand' but does not explain why this applies particularly to NZ contractors. One suspects it arises from provisions of the NZ Building Act but it would provide clarity if the statement were explained at the start and why the various NZ contractors mentioned have, apparently, chosen to leave the market.</p>	<p>The Introduction has been re-written to better portray the New Zealand context and why evaluating design buildability risk is important.</p>
18	<p>At line 39 for further example, the paper provides a 'typical scenario' where a contractor is employed on a fixed price contract to construct a new university block. This may be typical in NZ but I do wonder how typical it is globally particularly in UK contracts where NEC or JCT Forms of Contract may be more common and re-measurement contracts of one sort or another are usual. Whatever the assumptions made in the paper, it would be helpful if they were expressly identified because without this the bold statements of law given later in the paper may appear to be open to question.</p>	<p>Again, this section has been re-written for greater clarity. The context is now narrowed to NZS3910:2013. The point about the NZ Building Act has been clarified in that a reasonable standard of workmanship is implied for residential building contracts over \$30k for work to residential dwellings. This is to provide an example of alignment with the UK cases involving designer negligence where designs relied on exceptional levels of workmanship.</p>
19	<p>Similarly at line 46-48 the paper identifies the scope of the paper but should also, in my view, identify which Forms of Contract and type of contract (presumably fixed price contracts) are being addressed and what legislatures are being considered.</p>	<p>The context is now clarified as lump sum construction only contracts under NZS3910:2013 (most typical in New Zealand).</p>
20	<p>Part 3 Comments above apply also to part 3 in identifying the assumptions made in the employment of the CMM.</p>	<p>The scope of Section 6 has been clarified: This section examines CMM duties implied through case law and compares with that of contractors.</p>
	<p>Part 4 Clarity would be helpful at lines 93 and 111 where liability to provide a 'fit for purpose' product is considered. Normally this liability would be imposed only where the contractor has designed the project and the comment that liability 'depends on the interpretation of the contract' could usefully be expanded to give some further guidance.</p>	<p>The section about absolute liability has been re-written for clarity. Absolute liability and fitness for purpose relate to contractors in terms of their commercial liability, rather than a designer's responsibility to design something fit for the building users (taking reasonable skill and care). For example, contractors must remedy any defects at their cost, without clients first having to establish negligence (as they would for a designer).</p>
21	<p>Part 4.3 Scenario Reference is made to the Engineer taking a stricter stance on claims for variations. I wonder if that was intentional or should the reference have been to the courts taking a stricter stance? There may not be an Engineer in some Forms of Contract (NEC for example). Again this would be made clearer</p>	<p>NZS3910:2013 refers to the contract administrator and the 'Engineer' to the contract. Have changed wording to 'contract administrator'.</p>

	if the specific scope of the paper were set out early in the paper.	
22	Part 4.7 Clarity above applies also to the statements at lines 379 and 392 where entitlement to a change in price is considered. This issue depends entirely on the Form and Terms of contract and without a statement of assumptions of the Form and Type of contract it is very difficult to make meaningful comment.	Changed to: SCENARIO: It is unlikely that the instructed detail could constitute something wholly outside the contract scope. NZS3910:2013 contains provisions for Variations including a change in type or quantity or materials (9.1), for Underground and above-ground utilities (5.13), and 9.5 Unforeseen physical conditions (9.5).
23	Reviewer's Conclusion This is an interesting paper but one which would greatly benefit from an express statement on the specific scope of the paper, the assumptions made on the Form of Contract, the type of contract and the applicable law. Without such a statement it is very difficult to make meaningful comment on law as this paper seeks to do.	Fair points. The paper has been edited for better clarity.
24	If the paper could address the clarity of intentions and scope and the drafting of legal issues above, the paper may be a useful addition to the journal but would be better included in the Management section in my view.	This paper certainly does fall somewhere between the Law and Management categories. Perhaps categorising under Management, may better attract the intended audience (PMs, architects, PQS). We leave the decision with the Editor.

Contractor claim flowchart

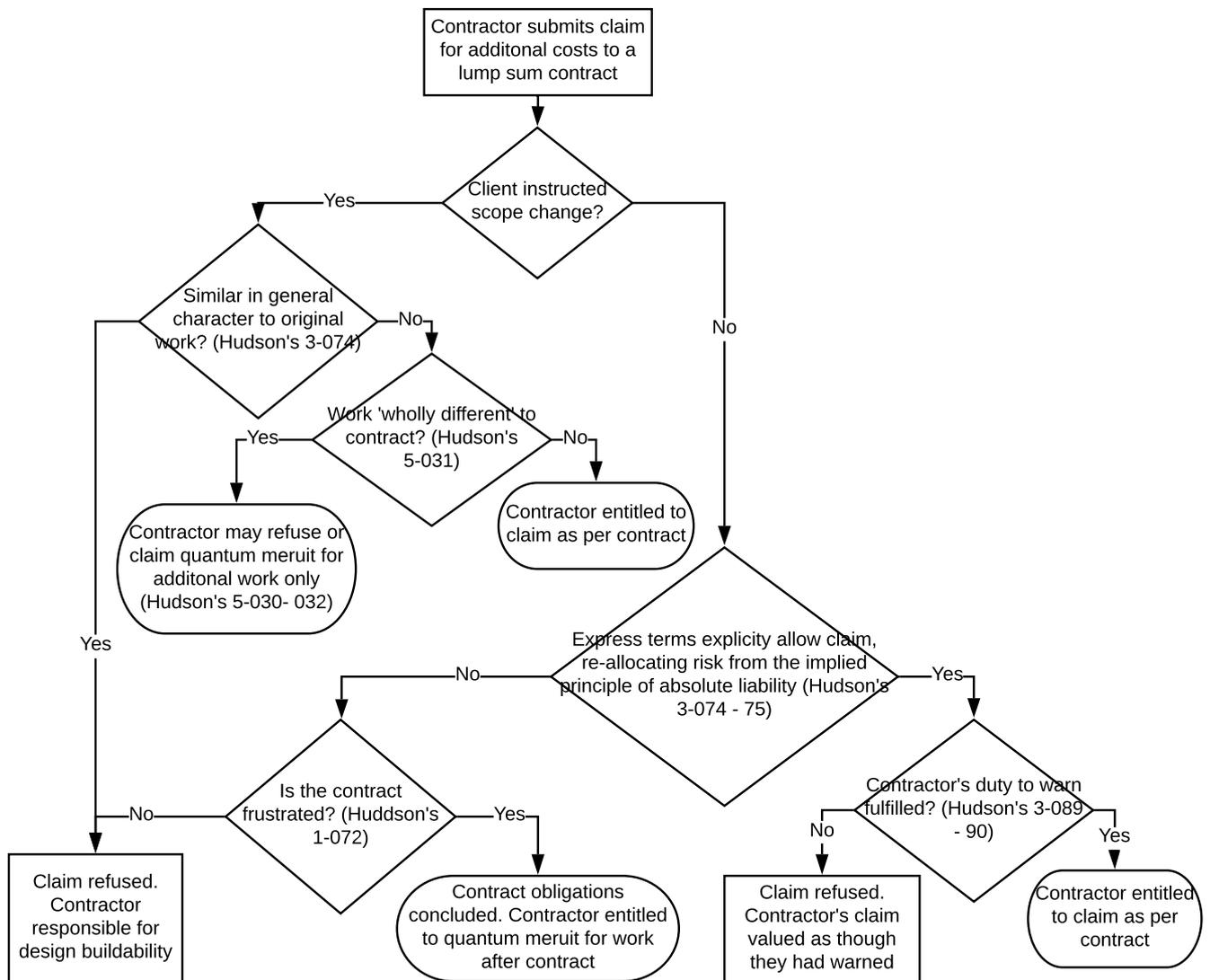


Table 1: Summary comparison of head contractor and CCM obligations

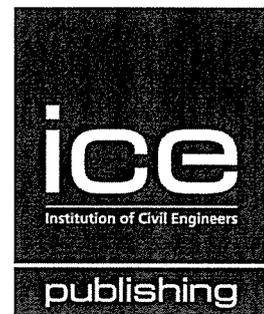
Obligation	Head contractor	Consultant manager
Construction	Absolute liability and fitness for purpose. NZ Building Act stipulates reasonable standards of workmanship and fit for purpose materials for residential work.	Reasonable skill and care for planning and managing construction work on behalf of the client who employs trade packages directly. (Section 6.2)
Duty to warn	<p>Duty through tort to warn of design compliance issues or cost increases after providing a budget. (Section 5.4)</p> <p>Test of foreseeability based on facts, and what any other reasonably competent similar contractor would have foreseen. (Section 5.4)</p> <p>ECI may influence foreseeability threshold in terms of time afforded and ECI team composition. (Section 5.4)</p>	Duty to warn of contractual risk and non-performance by team members, taking reasonable skill and care. (Section 6.3)
Procurement	Absolute liability for procuring all necessary work (inclusive price principle). (Section 5.1)	Procure all works necessary without gaps, so far as not negligent. (Section 6.2)
Time	<p>Absolute liability.</p> <p>Client can charge liquidated or general damages for late completion except for extension of time grounds permitted in the contract. (Section 5.1)</p>	Client relies on consultant apportioning damages to applicable trade packages, or must demonstrate that damages are consequential of the consultant's negligence. (Section 6.4)
Quality	<p>Absolute liability. Contractor responsible for remedying defects at their expense. (Section 5.1)</p> <p>Contractor may request that instructed drawings will comply with the Building Code when building using reasonable levels of workmanship (Section 5.7)</p>	Client relies on consultant apportioning remedial work to individual trade-packages, or must demonstrate the defects are consequential of the consultant's. (Section 6.4)
Cost	Held to fixed price, except for contractual compensation events, sufficiently different instructions, document ambiguities, or frustration. (Sections 5.1 – 5.5)	Reasonable skill and care when providing a budget. (Section 6.1). Must warn of cost increases. (Section 6.3)
Instructed drawing details	<p>Contractor incurs absolute liability for instructions similar in nature. Contract administrator respond to claims for instructed drawings by enquiring what the contractor allowed within their fixed price to produce a fit for purpose product. (Section 5.1)</p> <p>Contractor may claim variation costs for instructions sufficiently beyond the original scope. (Section 5.2)</p> <p>Contractor may refuse instructions wholly different to the original scope or perform work outside contract rates (Section 5.2)</p> <p>Contractor may claim cost difference for ambiguities in drawings under <i>contra proferentem</i>. (section 5.5), but not the</p>	May enforce inclusive price principle to individual trade-packages, though does not adopt an overall absolute liability for connectivity like a head contractor. (Section 6.4)

	cost for removing incorrect materials if they reasonably ought to have warned in advance (5.4 and NZS3910:2013, 5.21.1)	
Obligation	Head contractor	Consultant manager
Construction	Absolute liability and fitness for purpose. NZ Building Act stipulates reasonable standards of workmanship and fit for purpose materials for residential work.	Reasonable skill and care for planning and managing construction work on behalf of the client who employs trade packages directly. (Section 5.1)
Duty to warn	Duty through tort to warn of design compliance issues or cost increases after providing a budget. (Section 4.3) Test of foreseeability based on facts, and what any other reasonably competent similar contractor would have foreseen. (Section 4.3) ECI may increase foreseeability threshold in terms of time afforded and ECI team composition. (Section 4.3)	Duty to warn of contractual risk and non-performance by team members, taking reasonable skill and care. (Section 5.1)
Procurement	Absolute liability for procuring all necessary work (inclusive price principle). (Section 4.1)	Procure all works necessary without gaps, so far as not negligent. (Section 5.2)
Time	Absolute liability. Client can charge liquidated or general damages for late completion except for extension of time grounds permitted in the contract. (Section 4.1)	Client relies on consultant apportioning damages to applicable trade packages, or must demonstrate that damages are consequential of the consultant's negligence. (Section 5.1)
Quality	Absolute liability. Contractor responsible for remedying defects at their expense. (Section 4.1) Contractor may have some defense where a defective finished building relied on exceptional levels of workmanship to comply with building code. (Section 4.2) NZ Building Act limits workmanship to reasonable skill and care. (Section 4.2)	Client relies on consultant apportioning remedial work to individual trade-packages, or must demonstrate the defects are consequential of the consultant's. (Section 5.1)
Cost	Held to fixed price, except for contractual compensation events, sufficiently different instructions, document ambiguities, or frustration. (Sections 4.1, 4.4, 4.5, 4.6)	Reasonable skill and care when providing a budget. (Section 5.1). Must warn of cost increases. (Section 5.3)
Instructed drawing details	Contractor incurs absolute liability for instructions similar in nature. Engineer could ask contractor what they had allowed for to produce a fit for purpose product. (Section 4.1) Contractor may claim variation costs for instructions sufficiently beyond the original scope. (Section 4.5)	May enforce inclusive price principle to individual trade-packages, though does not adopt an overall absolute liability for connectivity like a head contractor. (Section 5.1)

Contractor may refuse instruction wholly different to the original scope or perform work outside contract rates (Section 4.5)

Contractor responsible for design changes requested for buildability (variations for the contractor's convenience). (Section 4.1)

Contractor may claim variations for inconsistencies in drawings under *contra proferentum*. (section 4.4)



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