

When I'm working on a problem,
I never think about beauty. I think
only how to solve the problem. But
when I have finished, if the solution
is not beautiful, I know it is wrong.
Richard Buckminster Fuller

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Lighting Design
Sustainable Design
Electrical Engineering

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STEENSEN VARMING

4.8 Lighting

General

Lighting shall be provided to the car park, fire stairs, lift lobbies and pedestrian link. The required illuminations levels for each of the spaces shall be in accordance with the Australian standards and the relevant guidelines.

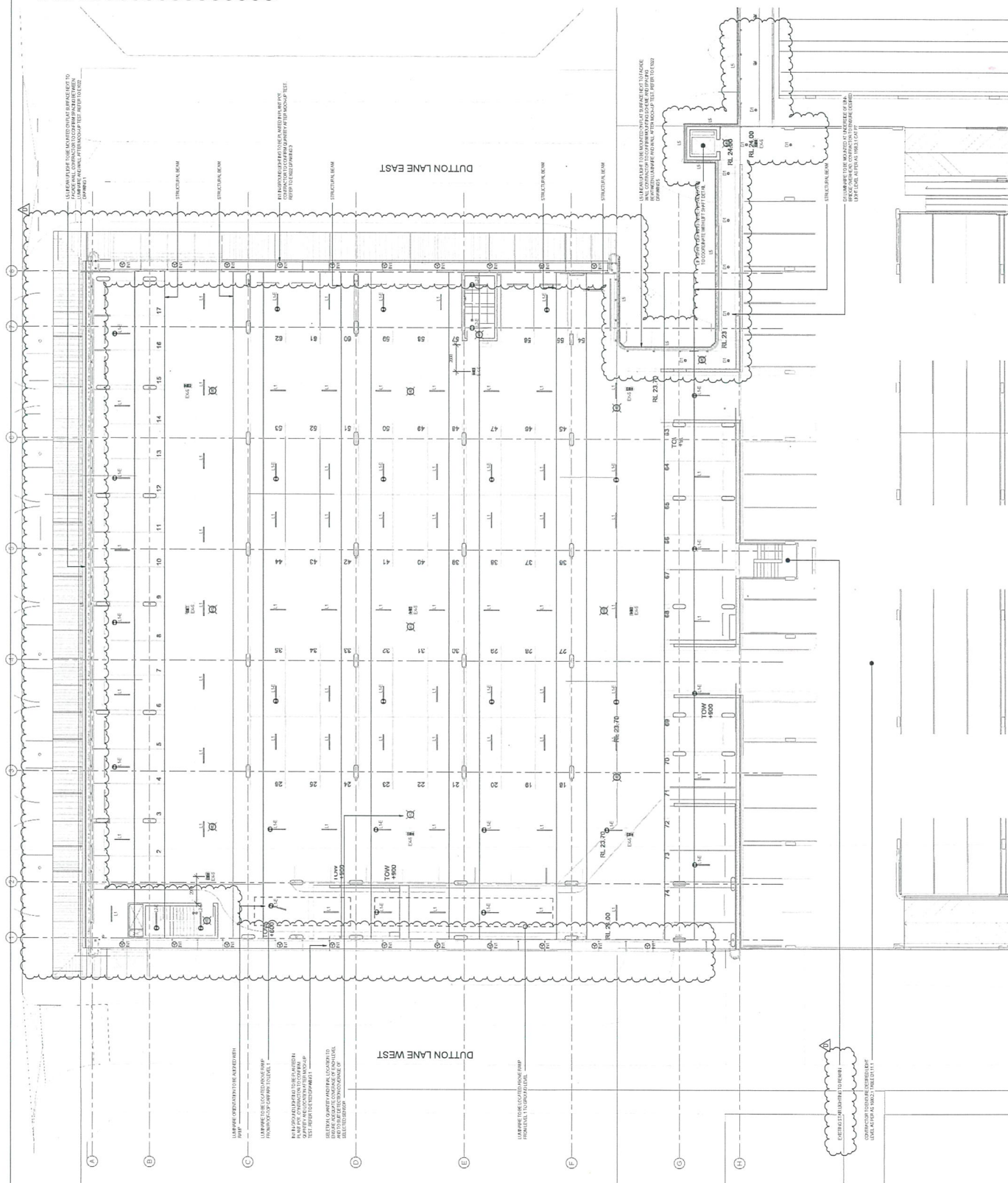
The emergency lighting equipment will be an integral part of the design and mainly concealed or unobtrusive. In line with this principle, emergency lighting will be integrated within general luminaires where possible or provided through dedicated recessed LED emergency fittings complete with self-contained battery and charger.

Standards

AS 1680
AS 1201.
AS 2325.
AS/NZS 2293
AS/NZS 60968 and AS/NZS 60969.
AS/NZS 60901.

Proposed

- Higher illumination levels are required at the entrance for the transition between the outside and inside of the carpark.
- Lighting control for the car park shall be designed to be controlled via BMS control, within activation time to be adjustable by the Council.
- Fire stair lighting will be 24 hour illuminated.
- Individual rooms will be locally switched.
- Lighting to the building perimeter will be via BMS and PE Cell control to deactivate external lighting during day light hours.
- Dimmers, dimmer controls, relays and relay controls as necessary.

[illegible]

LUBRIPANE OIL GRADE TO BE APPLIED WITH
PUMP _____

LUBRIPANE TO BE LOCATED ABOVE RAMP;
FROM FOOT OF CARRIAGE TO LEVEL 1 _____

RHS IS TO BE LOCATED TO BE PLANTED IN
PLANS FOR CONSTRUCTION TO CONFIRM
QUANTITY AND LOCATION AFTER MOULUP
TEST; REFER TO SECTION DRAWING 3 _____

SURVEY QUANTITY AND TOTAL LOCATION TO
ENSURE ADEQUATE COVERAGE OF ENVELOPE
TO BE USED IF THE COVERAGE OF _____

— LUMP SUM TO BE LOCATED ABOVE PUMP FROM LEVEL 1 TO GROUND LEVEL —

CONTRACTOR TO EXAMINE DESCRIBED LIGHT
FIXTURES AT SEEN AS SHOWN IN TABLE FOR 15.5'

JAG (C)CMT		M-1, M-2, M-3		M-4		M-5		M-6		M-7		M-8		M-9		M-10		M-11		M-12		M-13		M-14		M-15		M-16		M-17		M-18		M-19		M-20		M-21		M-22		M-23		M-24		M-25		M-26		M-27		M-28		M-29		M-30		M-31		M-32		M-33		M-34		M-35		M-36		M-37		M-38		M-39		M-40		M-41		M-42		M-43		M-44		M-45		M-46		M-47		M-48		M-49		M-50		M-51		M-52		M-53		M-54		M-55		M-56		M-57		M-58		M-59		M-60		M-61		M-62		M-63		M-64		M-65		M-66		M-67		M-68		M-69		M-70		M-71		M-72		M-73		M-74		M-75		M-76		M-77		M-78		M-79		M-80		M-81		M-82		M-83		M-84		M-85		M-86		M-87		M-88		M-89		M-90		M-91		M-92		M-93		M-94		M-95		M-96		M-97		M-98		M-99		M-100		M-101		M-102		M-103		M-104		M-105		M-106		M-107		M-108		M-109		M-110		M-111		M-112		M-113		M-114		M-115		M-116		M-117		M-118		M-119		M-120		M-121		M-122		M-123		M-124		M-125		M-126		M-127		M-128		M-129		M-130		M-131		M-132		M-133		M-134		M-135		M-136		M-137		M-138		M-139		M-140		M-141		M-142		M-143		M-144		M-145		M-146		M-147		M-148		M-149		M-150		M-151		M-152		M-153		M-154		M-155		M-156		M-157		M-158		M-159		M-160		M-161		M-162		M-163		M-164		M-165		M-166		M-167		M-168		M-169		M-170		M-171		M-172		M-173		M-174		M-175		M-176		M-177		M-178		M-179		M-180		M-181		M-182		M-183		M-184		M-185		M-186		M-187		M-188		M-189		M-190		M-191		M-192		M-193		M-194		M-195		M-196		M-197		M-198		M-199		M-200		M-201		M-202		M-203		M-204		M-205		M-206		M-207		M-208		M-209		M-210		M-211		M-212		M-213		M-214		M-215		M-216		M-217		M-218		M-219		M-220		M-221		M-222		M-223		M-224		M-225		M-226		M-227		M-228		M-229		M-230		M-231		M-232		M-233		M-234		M-235		M-236		M-237		M-238		M-239		M-240		M-241		M-242		M-243		M-244		M-245		M-246		M-247		M-248		M-249		M-250		M-251		M-252		M-253		M-254		M-255		M-256		M-257		M-258		M-259		M-260		M-261		M-262		M-263		M-264		M-265		M-266		M-267		M-268		M-269		M-270		M-271		M-272		M-273		M-274		M-275		M-276		M-277		M-278		M-279		M-280		M-281		M-282		M-283		M-284		M-285		M-286		M-287		M-288		M-289		M-290		M-291		M-292		M-293		M-294		M-295		M-296		M-297		M-298		M-299		M-300		M-301		M-302		M-303		M-304		M-305		M-306		M-307		M-308		M-309		M-310		M-311		M-312		M-313		M-314		M-315		M-316		M-317		M-318		M-319		M-320		M-321		M-322		M-323		M-324		M-325		M-326		M-327		M-328		M-329		M-330		M-331		M-332		M-333		M-334		M-335		M-336		M-337		M-338		M-339		M-340		M-341		M-342		M-343		M-344		M-345		M-346		M-347		M-348		M-349		M-350		M-351		M-352		M-353		M-354		M-355		M-356		M-357		M-358		M-359		M-360		M-361		M-362		M-363		M-364		M-365		M-366		M-367		M-368		M-369		M-370		M-371		M-372		M-373		M-374		M-375		M-376		M-377		M-378		M-379		M-380		M-381		M-382		M-383		M-384		M-385		M-386		M-387		M-388		M-389		M-390		M-391		M-392		M-393		M-394		M-395		M-396		M-397		M-398		M-399		M-400		M-401		M-402		M-403		M-404		M-405		M-406		M-407		M-408		M-409		M-410		M-411		M-412		M-413		M-414		M-415		M-416		M-417		M-418		M-419		M-420		M-421		M-422		M-423		M-424		M-425		M-426		M-427		M-428		M-429		M-430		M-431		M-432		M-433		M-434		M-435		M-436		M-437		M-438		M-439		M-440		M-441		M-442		M-443		M-444		M-445		M-446		M-447		M-448		M-449		M-450		M-451		M-452		M-453		M-454		M-455		M-456		M-457		M-458		M-459		M-460		M-461		M-462		M-463		M-464		M-465		M-466		M-467		M-468		M-469		M-470		M-471		M-472		M-473		M-474		M-475		M-476		M-477		M-478		M-479		M-480		M-481		M-482		M-483		M-484		M-485		M-486		M-487		M-488		M-489		M-490		M-491		M-492		M-493		M-494		M-495		M-496		M-497		M-498		M-499		M-500		M-501		M-502		M-503		M-504		M-505		M-506		M-507		M-508		M-509		M-510		M-511		M-512		M-513		M-514		M-515		M-516		M-517		M-518		M-519		M-520		M-521		M-522		M-523		M-524		M-525		M-526		M-527		M-528		M-529		M-530		M-531		M-532		M-533		M-534		M-535		M-536		M-537		M-538		M-539		M-540		M-541		M-542		M-543		M-544		M-545		M-546		M-547		M-548		M-549		M-550		M-551		M-552		M-553		M-554		M-555		M-556		M-557		M-558		M-559		M-560		M-561		M-562		M-563		M-564		M-565		M-566		M-567		M-568		M-569		M-570		M-571		M-572		M-573		M-574		M-575		M-576		M-577		M-578		M-579		M-580		M-581		M-582		M-583		M-584		M-585		M-586		M-587		M-588		M-589		M-590		M-591		M-592		M-593		M-594		M-595		M-596		M-597		M-598		M-599		M-600		M-601		M-602		M-603		M-604		M-605		M-606		M-607		M-608		M-609		M-610		M-611		M-612		M-613		M-614		M-615		M-616		M-617		M-618		M-619		M-620		M-621		M-622		M-623		M-624		M-625		M-626		M-627		M-628		M-629		M-630		M-631		M-632		M-633		M-634		M-635		M-636		M-637		M-638		M-639		M-640		M-641		M-642		M-643		M-644		M-645		M-646		M-647		M-648		M-649		M-650		M-651		M-652		M-653		M-654		M-655		M-656		M-657		M-658		M-659		M-660		M-661		M-662		M-663		M-664		M-665		M-666		M-667		M-668		M-669		M-670		M-671		M-672		M-673		M-674		M-675		M-676		M-677		M-678		M-679		M-680		M-681		M-682		M-683		M-684		M-685		M-686		M-687		M-688		M-689		M-690		M-691		M-692		M-693		M-694		M-695		M-696		M-697		M-698		M-699		M-700		M-701		M-702		M-703		M-704		M-705		M-706		M-707		M-708		M-709		M-710		M-711		M-712		M-713		M-714		M-715		M-716		M-717		M-718		M-719		M-720		M-721		M-722		M-723		M-724		M-725		M-726		M-727		M-728		M-729		M-730		M-731		M-732		M-733		M-734		M-735		M-736		M-737		M-738		M-739		M-740		M-741		M-742		M-743		M-744		M-745		M-746		M-747		M-748		M-749		M-750		M-751		M-752		M-753		M-754		M-755		M-756		M-757		M-758		M-759		M-760		M-761		M-762		M-763		M-764		M-765		M-766		M-767		M-768		M-769		M-770		M-771		M-772		M-773		M-774		M-775		M-776		M-777		M-778		M-779		M-780		M-781		M-782		M-783		M-784		M-785		M-786		M-787		M-788		M-789		M-790		M-791		M-792		M-793		M-794		M-795		M-796		M-797		M-798		M-799		M-800		M-801		M-802		M-803		M-804		M-805		M-806		M-807		M-808		M-809		M-810		M-811		M-812		M-813		M-814		M-815		M-816		M-817		M-818		M-819		M-820		M-821		M-822		M-823		M-824		M-825		M-826		M-827		M-828		M-829		M-830		M-831		M-832		M-833		M-834		M-835		M-836		M-837		M-838		M-839		M-840		M-841		M-842		M-843		M-844		M-845		M-846		M-847		M-848		M-849		M-850		M-851		M-852		M-853		M-854		M-855		M-856		M-857		M-858		M-859		M-860		M-861		M-862		M-863		M-864		M-865		M-866		M-867		M-868		M-869		M-870		M-871		M-872		M-873		M-874		M-875		M-876		M-877		M-878		M-879		M-880		M-881		M-882		M-883		M-884		M-885		M-886		M-887		M-888		M-889		M-890		M-891		M-892		M-893		M-894		M-895		M-896		M-897		M-898		M-899		M-900		M-901		M-902		M-903		M-904		M-905		M-906		M-907		M-908		M-909		M-910		M-911		M-912		M-913		M-914		M-915		M-916		M-917		M-918		M-919		M-920		M-921		M-922		M-923		M-924		M-925		M-926		M-927		M-928		M-929		M-930		M-931		M-932		M-933		M-934		M-935		M-936		M-937		M-938		M-939		M-940		M-941		M-942		M-943		M-944		M-945		M-946		M-947		M-948		M-949		M-950		M-951		M-952		M-953		M-954		M-955		M-956		M-957		M-958		M-959		M-960		M-	
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DESIGNED FOR QUALITY SYSTEM CERTIFIED AS COMPLIANT WITH ISO 9001 BY AN ACCREDITED CERTIFICATION BODY

T2 - REVISED FOR TENDER

Copenhagen
London
Sydney
Hong Kong

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STEENSEN VARMING

PROJECT
302 HUGHES STREET CARPARK
34-40 HUGHES STREET, CABRAMATTA, NSW

DRAWING TITLE
ELECTRICAL SERVICES AND LIGHTING
LIGHTING LAYOUT - LEVEL 01

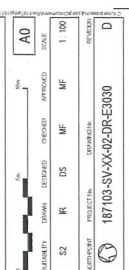
ELECTRICAL SERVICES AND LIGHTING
LIGHTING LAYOUT - LEVEL 01

SECURITY	DOWN	DELETED	CHANGED	AVOIDED	SCALE	AU
S2	IR	DS	MF	MF	1:100	



PROJECT No. 187103-SV-XX-01-DR-E3020

REVISION D



302 HUGHES STREET CARPARK
34-40 HUGHES STREET, CABRAMATTA, NSW
ELECTRICAL SERVICES AND LIGHTING
LIGHTING LAYOUT - LEVEL 02

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STEENSEN VARMINING

1422 *Journal of Interpersonal Violence 28(7)*

REV	ANALYZE DATE		DATE
	TESTER	LABORATORY	
A	ANALYST		09/05/19
B	TESTER		2/05/19
C	LABORATORY		2/05/19
D	LABORATORY		2/05/19

DECREASED WATER QUALITY SYSTEM CERTIFIED AS COMPLIANT WITH EPA RULE BY AN AGGREGATED GYPSUM KATALIN BOX

* Although The Boardman and Dodge master's report of "Boardman v. Dodge" is available at <http://www.fishbase.org>, it is not available in its entirety. The full text can be found at <http://www.fishbase.org/abstract.asp?id=7896>.
Received a pending patent. This invention and any improvements to the system have already been filed with the U.S. Patent Office.
The system has been used by several major water treatment plants in the United States and has received many awards and commendations from the industry.

FAT-TO-BE INVENTED FOR TENDER

\$340,000

2 URBAN PLANNING

- boom gates to ensure secure vehicle entry and exit
- appropriate lighting throughout carpark, including pedestrian entry points and around ticket machines and lifts etc
- provision of CCTV cameras

2.6 LIGHT POLLUTION

The existing residential apartment building to the west of the proposed car park has windows facing the car park. Light pollution from the additional 2 storeys of carpark has been assessed and addressed by the project electrical engineers Steensen Vaming.

The detained lighting design shall be in accordance with the Hughes Street Car Park Mechanical and Electrical Services DA Report. The following excerpt from the services report outlines the design parameters for lighting design:

“The artificial lighting to the car park including the carpark roof shall be designed to minimise light spill to adjacent properties and comply with the requirements of AS4282 Control of the Obtrusive Effects of Outdoor Light.”

WEST FACADE:

Solid concrete balustrades and upturns between 600mm - 1000mm high form barriers preventing direct headlight glare shining onto the adjacent residential buildings. Above the solid barriers, planting is proposed to minimise indirect headlight glare.

3 PARKING

NORTH FACADE:

The North facade is made up of a dense aluminium tube screen that will act to minimise headlight glare. It is also noted that to the north, residential dwellings are approximately 30m away, and across what is a highly trafficked road, with street lighting.

2.7 ACOUSTIC IMPACT

Acoustic Impact report by Marshall Day Acoustics confirms that noise emissions from the use of the car park have been calculated and demonstrates compliance with the NPfI noise level criteria at the nearest residential and commercial receivers.

3 PARKING

The proposed Hughes Street Car Park provides an additional 198 paid car parking spaces. The ground floor is accessed directly from Dutton Lane East with a direct entry from Dutton Lane East with 3.5m clear head height to allow for small rigid vehicle (SRV) access into and throughout the ground floor.

Level 1 and level 2 act as an extension of the Dutton Lane Car Park floor plate, and contains 74 and 78 parking spaces respectively. Level 2 is an open air roof and contains 4 E-Car charging stations for electric vehicles to support the expected growing demand.

3.1 GROUND FLOOR TIME SHARED PARKING

The ground floor of Hughes Street Car Park contains 67 paid car parking spaces, 26 of which are time-shared with 12 SRV parking spaces for commercial delivery vehicles.