

### GAS MEMBRANE VALIDATION – BELLE VUE

**Project Name: Belle Bue Stadium****Project Number: 12-123****Client: Countryside Properties****Date: 27-09-2023****Project Manager: S. Ellis – FGS, CEnv****E3P Engineer: J. James****Gas Membrane Installers Chandos Civils****Ground Gas Risk Assessment: Amber 1****Plots: 215-216**

### OVERVIEW

The membrane comprised a Visqueen low permeability gas membrane (Yellow) resistant to radon, carbon dioxide and low methane levels. E3P can confirm there were no holes or rips at the inspection time. Upon being laid, the membrane is to be covered with a Celotex (closed Cell) floor insulation material which is considered to provide a high degree of protection.

E3P inspected all external joints, and E3P can confirm that the membrane was overlapped and double-taped. The membrane was taped using double-sided jointing tape. All the overlaps were then additionally taped using foil-backed girth tape.

Each unit has a service duct located at the front and outer edge of the property. E3P inspected each one and can confirm that the top hats have been adequately sealed against the membrane.

Based on the information provided within this report, the site inspections and validation checklists, E3P can confirm that plots 215-216 have been installed with gas protection measures following C Amber 1 to an acceptable level of workmanship.

A list of plots requiring validation and their associated validation letters is presented in Table 1.



Geo-Environmental



Acoustics

Remediation and  
Enabling Earthworks  
Design

Arboriculture

Compliance  
& Due Diligence

Ecology



Industrial Permitting



Geotechnical

## MEMBRANE SPECIFICATION: VISQUEEN GAS MEMBRANE (YELLOW)

### Technical Datasheet - Product Overview



Technical support: +44 (0) 333 202 6800

Date Published: 18/10/2021

### Visqueen Low Permeability Gas Membrane

#### Features and benefits

- BBA certified - third party accreditation
- Complies with NHBC Amber 1 - suitable for low gas risk NHBC housing sites
- Flexible - easy to detail and install on site
- Supplied centre folded - reduces the risk of cracks in screed and limits creases
- Multi functional - also acts as a radon and damp proof membrane
- Dual jointing methods - lap joints can be taped or heat welded

#### Product description

Visqueen Low Permeability Gas Membrane is a robust co-polymer thermoplastic gas membrane, 0.5mm thick, yellow in colour and supplied 4m x 12.5m in a center folded roll.

#### Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of NHBC Amber 1 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

#### Usage

Visqueen Low Permeability Gas Membrane is suitable to prevent the ingress of harmful levels of ground gases for housing applications where NHBC are the warranty provider and the site has been classified as Amber 1. In this application, the membrane is used above a precast suspended segmental ground floor system, for example a beam and block floor.

The membrane can also be used as a high performance radon membrane and/or damp proof membrane positioned within the ground floor construction either above or below the structural floor.

The product is not intended for use where there is a risk of hydrostatic pressure.

#### System components

- VisqueenPro Double Sided Jointing Tape, 50mm x 10m
- Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m
- Visqueen Top Hat Units

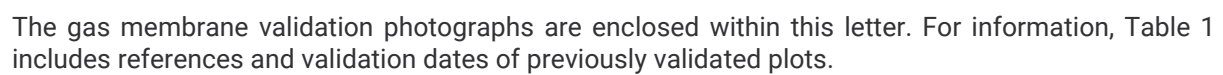


TABLE 1 – VALIDATION LETTER REFERENCE

| PLOT NUMBER | DATE                        | REPORT NUMBER |
|-------------|-----------------------------|---------------|
| 1           | 3 <sup>rd</sup> March 2022  | V4            |
| 2           | 3 <sup>rd</sup> March 2022  | V4            |
| 3           | 3 <sup>rd</sup> March 2022  | V4            |
| 4           | 29 <sup>th</sup> March 2022 | V5            |
| 5           | 29 <sup>th</sup> March 2022 | V5            |
| 6           |                             |               |
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| 86 | 27 <sup>th</sup> May 2022  | V9  |
| 87 | 27 <sup>th</sup> May 2022  | V9  |
| 88 | 27 <sup>th</sup> May 2022  | V9  |
| 89 | 25 <sup>th</sup> May 2022  | V8  |
| 90 | 25 <sup>th</sup> May 2022  | V8  |
| 91 | 25 <sup>th</sup> May 2022  | V8  |
| 92 | 8 <sup>th</sup> June 2022  | V12 |
| 93 | 8 <sup>th</sup> June 2022  | V12 |
| 94 | 28 <sup>th</sup> June 2022 | V15 |
| 95 | 28 <sup>th</sup> June 2022 | V15 |
| 96 |                            |     |
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| <b>99</b>  | 30 <sup>th</sup> May 2022  | V10 |
| <b>100</b> | 31 <sup>st</sup> May 2022  | V11 |
| <b>101</b> | 31 <sup>st</sup> May 2022  | V11 |
| <b>102</b> | 15 <sup>th</sup> June 2022 | V13 |
| <b>103</b> | 15 <sup>th</sup> June 2022 | V13 |
| <b>104</b> | 22 <sup>nd</sup> June 2022 | V14 |
| <b>105</b> | 22 <sup>nd</sup> June 2022 | V14 |
| <b>106</b> |                            |     |
| <b>107</b> |                            |     |
| <b>108</b> | 4 <sup>th</sup> July 2022  | V15 |
| <b>109</b> | 4 <sup>th</sup> July 2022  | V15 |
| <b>110</b> | 19 <sup>th</sup> July 2022 | V18 |
| <b>111</b> |                            |     |
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| <b>124</b> |                                 |     |
| <b>125</b> | 8 <sup>th</sup> September 2022  | V23 |
| <b>126</b> | 8 <sup>th</sup> September 2022  | V23 |
| <b>127</b> | 8 <sup>th</sup> September 2022  | V23 |
| <b>128</b> | 8 <sup>th</sup> September 2022  | V23 |
| <b>129</b> | 8 <sup>th</sup> September 2022  | V23 |
| <b>130</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>131</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>132</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>133</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>134</b> | 5 <sup>th</sup> September 2022  | V21 |
| <b>135</b> | 15 <sup>th</sup> September 2022 | V25 |
| <b>136</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>137</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>138</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>139</b> | 23 <sup>rd</sup> August 2022    | V20 |
| <b>140</b> | 4 <sup>th</sup> August 2022     | V19 |
| <b>141</b> | 15 <sup>th</sup> July 2022      | V17 |
| <b>142</b> | 15 <sup>th</sup> July 2022      | V17 |
| <b>143</b> | 11 <sup>th</sup> July 2022      | V16 |
| <b>144</b> | 11 <sup>th</sup> July 2022      | V16 |
| <b>145</b> | 11 <sup>th</sup> July 2022      | V16 |
| <b>146</b> | 9 <sup>th</sup> May 2022        | V6  |
| <b>147</b> | 9 <sup>th</sup> May 2022        | V6  |
| <b>148</b> | 9 <sup>th</sup> May 2022        | V6  |

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|------------|---------------------------------|-----|
| <b>149</b> | 9 <sup>th</sup> May 2022        | V6  |
| <b>150</b> | 13 <sup>th</sup> May 2022       | V7  |
| <b>151</b> | 9 <sup>th</sup> May 2023        | V43 |
| <b>152</b> | 9 <sup>th</sup> May 2023        | V43 |
| <b>153</b> | 2 <sup>nd</sup> June 2023       | V44 |
| <b>154</b> | 2 <sup>nd</sup> June 2023       | V44 |
| <b>155</b> | 8 <sup>th</sup> June 2023       | V46 |
| <b>156</b> | 8 <sup>th</sup> June 2023       | V46 |
| <b>157</b> |                                 |     |
| <b>158</b> |                                 |     |
| <b>159</b> | 19 <sup>th</sup> July 2023      | V48 |
| <b>160</b> | 19 <sup>th</sup> July 2023      | V48 |
| <b>161</b> | 2 <sup>nd</sup> August 2023     | V50 |
| <b>162</b> | 9 <sup>th</sup> August 2023     | V51 |
| <b>163</b> | 7 <sup>th</sup> February 2023   | V40 |
| <b>164</b> | 7 <sup>th</sup> February 2023   | V40 |
| <b>165</b> | 7 <sup>th</sup> February 2023   | V40 |
| <b>166</b> | 7 <sup>th</sup> February 2023   | V40 |
| <b>167</b> | 4 <sup>th</sup> November 2022   | V31 |
| <b>168</b> | 24 <sup>th</sup> September 2022 | V26 |
| <b>168</b> | 24 <sup>th</sup> September 2022 | V26 |
| <b>169</b> |                                 |     |
| <b>170</b> | 5 <sup>th</sup> October 2022    | V27 |
| <b>171</b> | 21 <sup>st</sup> November 2022  | V33 |
| <b>172</b> | 21 <sup>st</sup> November 2022  | V33 |

|            |                                                                 |            |
|------------|-----------------------------------------------------------------|------------|
| <b>173</b> | 23rd November 2022                                              | V34        |
| <b>174</b> | 12 <sup>th</sup> December 2022                                  | V35        |
| <b>175</b> | 12 <sup>th</sup> December 2022                                  | V35        |
| <b>176</b> | 15 <sup>th</sup> December 2022                                  | V36        |
| <b>177</b> | 15 <sup>th</sup> December 2022                                  | V36        |
| <b>178</b> | 4 <sup>th</sup> November 2022<br>10 <sup>th</sup> November 2022 | V31<br>V32 |
| <b>179</b> | 4 <sup>th</sup> November 2022                                   | V31        |
| <b>180</b> | 4 <sup>th</sup> November 2022                                   | V31        |
| <b>181</b> | 27 <sup>th</sup> October 2022                                   | V30        |
| <b>182</b> | 27 <sup>th</sup> October 2022                                   | V30        |
| <b>183</b> | 27 <sup>th</sup> October 2022                                   | V30        |
| <b>184</b> | 24 <sup>th</sup> October 2022                                   | V29        |
| <b>185</b> | 24 <sup>th</sup> October 2022                                   | V29        |
| <b>186</b> | 24 <sup>th</sup> October 2022                                   | V29        |
| <b>187</b> | 24 <sup>th</sup> October 2022                                   | V29        |
| <b>188</b> |                                                                 |            |
| <b>189</b> | 21 <sup>st</sup> November 2022                                  | V33        |
| <b>190</b> | 21 <sup>st</sup> November 2022                                  | V33        |
| <b>191</b> | 1 <sup>st</sup> September 2022                                  | V22        |
| <b>192</b> | 1 <sup>st</sup> September 2022                                  | V22        |
| <b>193</b> | 1 <sup>st</sup> September 2022                                  | V22        |
| <b>194</b> | 22 <sup>nd</sup> September 2022                                 | V24        |
| <b>195</b> | 22 <sup>nd</sup> September 2022                                 | V24        |
| <b>196</b> | 24 <sup>th</sup> September 2022                                 | V26        |
| <b>197</b> | 24 <sup>th</sup> September 2022                                 | V26        |

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| <b>198</b> | 12 <sup>th</sup> October 2022   | V28 |
| <b>199</b> | 12 <sup>th</sup> October 2022   | V28 |
| <b>200</b> | 24 <sup>th</sup> October 2022   | V29 |
| <b>201</b> | 24 <sup>th</sup> October 2022   | V29 |
| <b>202</b> | 24 <sup>th</sup> October 2022   | V29 |
| <b>203</b> | 24 <sup>th</sup> October 2022   | V29 |
| <b>204</b> | 23 <sup>rd</sup> February 2023  | V40 |
| <b>205</b> | 23 <sup>rd</sup> February 2023  | V40 |
| <b>206</b> | 23 <sup>rd</sup> February 2023  | V40 |
| <b>207</b> | 23 <sup>rd</sup> February 2023  | V40 |
| <b>208</b> | 1 <sup>st</sup> March 2023      | V41 |
| <b>209</b> | 1 <sup>st</sup> March 2023      | V41 |
| <b>210</b> |                                 |     |
| <b>211</b> |                                 |     |
| <b>212</b> |                                 |     |
| <b>213</b> |                                 |     |
| <b>214</b> |                                 |     |
| <b>215</b> | 27 <sup>th</sup> September 2023 | V56 |
| <b>216</b> | 27 <sup>th</sup> September 2023 | V56 |
| <b>217</b> | 13 <sup>th</sup> September 2023 | V55 |
| <b>218</b> | 13 <sup>th</sup> September 2023 | V55 |
| <b>219</b> | 13 <sup>th</sup> September 2023 | V55 |
| <b>220</b> | 27 <sup>th</sup> April 2023     | V42 |
| <b>221</b> | 27 <sup>th</sup> April 2023     | V42 |
| <b>222</b> | 27 <sup>th</sup> April 2023     | V42 |

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|------------|--------------------------------|-----|
| <b>223</b> | 22 <sup>nd</sup> August 2023   | V53 |
| <b>224</b> | 18 <sup>th</sup> August 2023   | V52 |
| <b>225</b> | 9 <sup>th</sup> August 2023    | V51 |
| <b>226</b> | 27 <sup>th</sup> July 2023     | V49 |
| <b>227</b> | 27 <sup>th</sup> July 2023     | V49 |
| <b>228</b> | 19 <sup>th</sup> July 2023     | V48 |
| <b>229</b> | 19 <sup>th</sup> July 2023     | V48 |
| <b>230</b> | 7 <sup>th</sup> July 2023      | V47 |
| <b>231</b> | 7 <sup>th</sup> July 2023      | V47 |
| <b>232</b> |                                |     |
| <b>233</b> |                                |     |
| <b>234</b> | 4 <sup>th</sup> September 2023 | V54 |
| <b>235</b> | 4 <sup>th</sup> September 2023 | V54 |
| <b>236</b> | 24 <sup>th</sup> Jan 2022      | V1  |
| <b>237</b> | 24 <sup>th</sup> Jan 2022      | V1  |
| <b>238</b> | 24 <sup>th</sup> Jan 2022      | V1  |
| <b>239</b> | 24 <sup>th</sup> Jan 2022      | V1  |
| <b>240</b> | 18 <sup>th</sup> May 2023      | V44 |
| <b>241</b> | 18 <sup>th</sup> May 2023      | V44 |
| <b>242</b> | 15 <sup>th</sup> February 2022 | V3  |
| <b>243</b> | 15 <sup>th</sup> February 2022 | V3  |
| <b>244</b> |                                |     |
| <b>245</b> |                                |     |
| <b>246</b> | 24 <sup>th</sup> January 2022  | V2  |
| <b>247</b> | 24 <sup>th</sup> January 2022  | V2  |

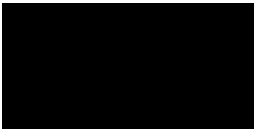
**Belle Vue**  
Gas Validation  
September 2023

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| <b>248</b>                         |                                                                 |            |
| <b>249</b>                         |                                                                 |            |
| <b>250</b>                         |                                                                 |            |
| <b>Apartment Block 1</b>           | 15 <sup>th</sup> September 2022<br>5 <sup>th</sup> October 2022 | V25<br>V27 |
| <b>Apartment Block 1 Stairwell</b> | 19 <sup>th</sup> January 2023<br>20 <sup>th</sup> January 2023  | V38<br>V39 |
| <b>Apartment Block 2</b>           | 23 <sup>rd</sup> August 2022                                    | V20        |

GAS MEMBRANE VALIDATION

Complete

|                               |                                                                                                                                                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Name                     | Belle Vue                                                                                                                                                      |
| Location                      | Manchester<br>England<br>M18<br>United Kingdom<br>(53.46158675034971, -<br>2.186404381164356)                                                                  |
| Project Manager               | Stuart Ellis                                                                                                                                                   |
| Project number                | 12123                                                                                                                                                          |
| Developer                     | Countryside                                                                                                                                                    |
| Site representative Signature | <div></div> <div>Pete<br/>27 Sep 2023 11:37 AM BST</div> <div>Chandos</div> |
| Conducted on                  | 27 Sep 2023 10:59 AM BST                                                                                                                                       |
| Prepared by                   | Jordan James                                                                                                                                                   |

## Inspection Gas Membrane

### Plot Inspection

#### Plot Inspection 1

Plot Number 216

Type of Development: Other add note

House

Foundation Type: Other add note

Suspended Floor

Gas Membrane Type: Manufacturer, gauge, and colour.

Gold Visqueen

Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED

Pass

Laps, welds, and joints seals: Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice? Are welds complete? Appropriate joining/double-sided tape used, Folds running in line with joints? (no joints cutting across folds)

Pass

Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips?

Yes



Photo 1



Photo 2



Photo 3



Photo 4

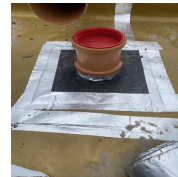


Photo 5



Photo 6

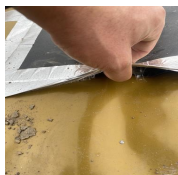


Photo 7

Type of joints/ Lapping

Welded

Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.

Pass



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17

**Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?**

Yes



Photo 18



Photo 19

**Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.**

Pass

**Slab / membrane condition (is membrane clear of debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove an debris so membrane can be fully seen and inspected – this is a requirement of NHBC and local authorities.**

Pass

**External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)**

Pass



Photo 20



Photo 21

## Plot Inspection 2

**Plot Number** 215

**Type of Development: Other add note** House

**Foundation Type: Other add note** Suspended Floor

**Gas Membrane Type: Manufacturer, gauge, and colour.** Gold Visqueen

**Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to lain gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED** Pass

**Laps, welds, and joints seals: Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice? Are welds complete? Appropriate joining/double-sided tape used, Folds running in line with joints? (no joints cutting across folds)** Pass

**Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips?** Yes



Photo 22



Photo 23

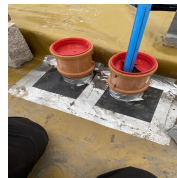


Photo 24



Photo 25



Photo 26



Photo 27

**Type of joints/ Lapping** Welded

**Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.** Pass



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36

**Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?**

Yes



Photo 37



Photo 38

**Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.**

Pass

**Slab / membrane condition (is membrane clear of debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove an debris so membrane can be fully seen and inspected – this is a requirement of NHBC and local authorities.**

Pass

**External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)**

Pass



Photo 39



Photo 40

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## Passive Venting

**Sub-floor Void: Is a check possible on future plots (insert Plot number or NO in text box)**

No

## Media summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40