Construction
Industry Federation

Coronavirus
COVID-19

Working
Remotely:
**Virtual
Design &
Construction
(VDC)**

April 2020

Digital Tools to Maintain Social Distancing

Work from Home
Facilitate remote working

Web Meetings
Avoid face to face meetings
Use Teams, Zoom
or Skype Meetings
Facilitate remote working

Cloud CDE
Use Cloud based collaboration systems

AR/VR
Use VR for remote model walk throughs

Fast Track
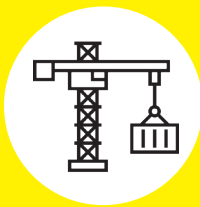Streamline approval process Cloud based collaboration

Camera's / Video Footage
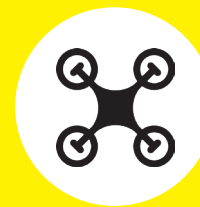Progress Walk, Safety Walks, Virtual Snagging

BIM
3D design cordination
3D model viewers
4D logistic planning

Off Site
Maximise off site fabrication & DFMA process

Drone Technology
Use for remote site inspections, topography surveys

Construction with Social Distance

Digital construction tools and BIM processes can be utilised to maintain social distancing while still progressing with construction activities and to fast track critical projects.

This report will explore and expand on the best methods and practices to implement in your business.

Table of Contents

Section 1 **Introduction**

1.1 Purpose

The purpose of this document is to give members of the industry guidance on working remotely during COVID-19 Construction Shutdown from Friday 27th March 2020 and this new or continued way of working can be carried on into future Construction Projects following the successful implementation in their business.

COVID-19 presents us with one of the greatest challenges we have seen during our lifetimes, across all sectors – business, public and private.

1.2 Document goal

The goal of the document is to provide direction to organisations within the construction industry on basic digital requirements to allow remote working including; Digital Strategy, Guidance, Protocols, Hardware/ Software.

This guidance document will give newcomers to Building Information Modelling (BIM) & Virtual Design & Digital Construction (VDC) a broad understanding of the process, as well as guidance on how to manage a project which utilises digital workflows. In the context of construction, BIM is the process of delivering and operating built assets using well-structured digital information that all the necessary parties have access to.

BIM is a way of working, rather than a physical object or an entity.

Operating in this way – often referred to as 'working in a BIM environment' – requires all parties to collaborate and share the information they create in a mutually accessible online space known as a Common Data Environment or CDE.

▶ This document is **not** just for BIM projects but for digital working as a whole across the sector.

This document outlines digital methods and procedures for companies within the Construction and Civil Engineering Industry, to assist them to maintain working during the COVID-19 crisis.

Virtual Design & Construction (VDC) Working Remotely

▶ **DIGITAL STRATEGY**
Initiate complete inventory of digital tools required to hand and perform gap analysis of what is require to facilitate remote working.

▶ **COMMUNICATION AND COLLABORATION**
Online meetings, video calls, workplace authoring, Cloud based collaboration platforms, Cloud based collaboration tools for 3D authoring software.

▶ **COMMON DATA ENVIRONMENT (CDE)**
Central location for project information. Workflow approval processes.

▶ **BUILDING INFORMATION MODELLING**
BIM Model central to successful project delivery. 3D model used for design development and pre construction planning. 4D programming and logistic planning.

▶ **DIGITAL INNOVATION**
Utilise live site cameras and drones to enable remote inspections and reporting on site progress. (VR) Virtual walk downs with client / project team. Mobile apps for field reporting and safety inspection. (AR) Augmented Reality to access the site in a Virtual Environment.

Section 2   **Guidance**

When a crisis like the coronavirus pandemic hits an organisation, its executives need to assess the impact on their business, both immediately and over the long term.

An organisation's capabilities are the fuel that drives the engine, allowing your Company to create value for customers. A crisis may put a strain on your capabilities — and it may also require that you prioritise different capabilities than usual. Facilities management will take up less time, but IT support for tools like video conferencing may take up more.

Supply chain and production capabilities will be top of the agenda and more resource intensive than usual in many organisations since international supply chains are being disrupted. Employees' typical levels of performance and productivity will be affected by the move to home offices, restrictions on travel, and illness.

The implementation and utilisation of new technologies is more than applying a new piece of hardware to the existing processes within their organisation and hope that this will solve all the issues.

It requires a re-evaluation of the current business processes and procedures.

To allow for growth a number of elements are required to be aligned to ensure that change can occur.

It is helpful for an organisation to ask themselves what it is that they wish to achieve by adopting new technologies within their organisation? This allows the company to start the process with a clear picture or roadmap of where they want to go and assists them in making clear and informed decisions to get from where they currently are to where they aim to be.

Construction companies need to inform themselves as much as possible about the available digital technologies and determine the steps that they need to take to approach it. Trying to adopt digital technologies within a company without knowing what it entails can do more harm than good and can result in wasted time, resources, and a loss of faith in the technology by the staff.

Developing a plan for the implementation of these digital technologies enables an organisation to create a clear and structured map that allows all stakeholders to envision how each process and change fits into the bigger digital process picture.

2.1 Digital Strategic Plan

This Digital Strategic Plan can then be used to formulate goals and objectives, enabling the organisation to progress in the required direction.

To support the organisation's digital strategy, the following should be questioned.

2.2 Where are we now?

▶ Review the current hardware utilised

▶ Review the current software utilised

▶ Are all processes and procedures documented?

▶ How is information shared between departments?

▶ How is information shared to external companies?

▶ How is information shared and tracked in a secure manner?

2.3 Where do we want to be?

▶ Enable a paperless workflow

▶ Utilise 3D models

▶ Utilise drone technology

▶ Upskill all staff to be capable of utilising the new digital solutions

▶ Upgrade hardware across the company

▶ Increase collaboration between company departments

▶ Enable remote working

2.4 How are we going to close the gap?

▶ Ensure senior management buy in

▶ Ensure the vision of the Digital strategy is clearly informed to all staff

▶ Appoint a digital implementation champion

▶ Set up a company steering group

▶ Hire an external consultant to support this process

▶ How do you ensure that you apply a consistent approach to your customers?

These are all important considerations to ensure that a company has a credible, consistent, and viable Digital Implementation Strategy.

Furthermore, the development of a structured Digital Strategic Plan must also align with the goals of your organisation. With the rapid spread of Covid-19, construction companies must prioritise the care and protection of their team, helping them to adapt to new working conditions. This can be achieved through building trust and resilience amongst staff, focusing on communication and collaboration and cultivating a digital culture within the team.

During this time, it is crucial that construction companies step up and empower their teams with the tools and skills necessary to adapt to a new digital way of working. They should lead with compassion, showing empathy towards employees and embracing transparency through regular communication via internal memos, social media groups, apps like Microsoft Teams and blogs.

An effective digital culture requires digital collaboration. Shared learnings and insights between teams is paramount to a productive digital culture and project managers should encourage this by engaging their project team in share sessions.

2.5 Digital strategy - lessons learned

Organisations should focus on creating the right conditions for their team to succeed. Some lessons learned that organisations should be mindful of before setting out on this journey:

1. Technology is always changing — knowing where to start is not obvious, and the learning process never ends.

2. For most people, implementing/using technology requires learning a new set of skills, and the learning curve can be steep. Resistance will occur, ensure opportunity for resistance is removed.

3. Embracing and implementing technology does not guarantee future success; in fact, most tech professionals and innovators will recommend the "fail fast" model — fail fast, learn, move on.

4. There are no right answers — just educated bets based on calculated risk and perceived rewards.

2.6 Key points to support a digital strategy

The following key points are digital enablers and processes to help support a Digital Strategy to enable remote working across the construction industry. Not all digital enablers below are required to work remotely but each process is guidance and will support your project team to maintain as much productivity as possible during this period;

Communication and Collaboration Platform

▶ Online meetings

▶ Collaboration platform

▶ Video Communication

▶ Workplace chat

▶ Application integration

Common Data Environment

▶ One Central location for Project Information

▶ Workflow Approval process

▶ Avoid disputes caused by misinformation

BIM Model

For projects that have a BIM model available during this period, the BIM Model can be central to the success of potential opportunities gained. For projects that are only operating in 2D this may be an opportunity to develop the project in 3D. Please see the guidance documents listed in Section 7.2 to support your BIM strategy;

3D BIM Coordination

▶ Online Coordination Meetings

▶ Design Coordination

▶ Pre-Fabrication

▶ IFC – Issue for Construction Review

▶ Virtual Reality (VR) Walk down with Client / Project Team

▶ (AR) Augmented Reality to access the Site in a Virtual Environment

4D BIM Construction Sequence

▶ Construction Methodology

▶ Construction Optioneering

▶ Progress Reporting

▶ Planned Vs Actual Reporting

DFMA – Design for Manufacture and Assembly

▶ Offsite Construction

▶ Design for Manufacture

▶ Design for Assembly

▶ Rapid Build

▶ Right first time Construction

Drone Footage

- Progress Reporting
- Logistics
- Traffic Management
- Health & Safety Overview

Live Time Lapse Camera

- Review Construction progress
- Progress Tracking
- Mobile Access
- Progress Reporting

Progress Photos and Video Footage

- Multiple people accessing the project remotely
- Progress Walk
- Safety Walks
- Virtual Snagging

Mobile Access to Project in Tablets

- Communication on the go
- Seamless Collaboration
- Access Anywhere, Anytime 24-7

2.7 Recommendations

- **Set up a steering group within your organisation.**

- **Establish a collaboration platform for team to communicate Internally.**

- **Review options to allow access for team to Internal Server via VPN or VDI.**

- **Allow staff to bring home desktops, laptops and monitors.**

- **Check with their staff regarding home Internet access and available speeds.**

- **Offer portable modems to staff members who may not have access to broadband.**

- **Provide LAN cables to connect desktops to routers for increased speeds as required.**

- **Allow staff to take home office chairs**.

- **Once internal communication within an individual organisation has been established, please reach out to the wider project team and agree on certain protocols. Validate current process are working if BEP and CDE are already established/defined or develop a plan if these items are absent. Identify project key leads and agree a workflow for collaboration between the different project team organisations.**

- **Use this period as an opportunity to get ahead for coordination, BIM development and model design review. Facility Maintenance planning.**

- **Develop and prepare for a remobilisation strategy, post COVID-19 restrictions.**

Section 3 **Guidance on Essential & Rapid Build Projects**

The following bullet points are relevant to those working in the current environment in terms of **remote working, working on essential projects** and on **rapid build projects** that are occurring in response to the COVID-19 Pandemic and the HSE guidelines announced in March and April of 2020. These are the protocols and measures that may need to be modified from your traditional working approach prior to COVID-19. The below is a suggested "how to" in terms of the underlined elements listed above and may not be applicable in every situation.

- Senior/Contracts Managers/Project/Design Managers – create a daily/regular huddle with your team using Zoom or Microsoft Teams to mimic the Daily Whiteboard meeting/Internal meetings – Replicate your more structured meetings in work (Design Team meetings/Design Review Meetings) by starting off with a casual conversation before jumping straight into work.

- Schedule your time and stick to it - make a definitive time to finish your work so you can switch to home mode. Track your time and put limits in.

- Show your face: Video calls are fantastic, seeing someone's face is important for more meaningful conversations however keep meetings brief as normal.

- Minimise Social Media which has a negativity bias. This feeds anxiety. Stay involved and create a company/project WhatsApp/Slack group.

- Look at prefabrication or off site techniques for construction tasks, Bathroom Pods, LGS, Precast, Prefabrication of Steel Reinforcement. Along with being primarily a time saving task on-site for rapid build projects, it also reduces the social interaction element that would have happened with on-site activities.

- Have your **quality manager** update your Quality Management Systems and protocols where necessary to include for working remotely or on essential or rapid builds. Look at the key contractor project management activities like BEPs, Design review, submittals, RFIs and meeting minutes.

- Submittals may need to be streamlined and the review period shortened. Use something like Bluebeam Studio to quicken review. Alternatively share your Video Conferencing screen and try to get approval in principle there and then.

- BEPs issued as a working document to be a dynamically reviewed document as necessary. Collaboration and agreement is required by your supply chain on this as things can change.

- Construction activities may be ahead of construction documents due to fast nature of construction. i.e BIM protocol issued giving model precedence.

Please refer to Glossary

- Where drawings can't be avoided ensure a well thought out design programme or TIDP is issued by your Design Team outlining the priority items when you need them. Combine into an overall MIDP and have project manager track the items on this. Look out for long lead items i.e drawing release for medical bedhead trunking - 8 week lead in time for a 12 week duration project.

- Similar to submittals, allow for drawings to be fast tracked for approval from Shared S3 to S4 and published A1. Use Microsoft Teams or Zoom meetings with shared screen to review drawings and expedite process (avoid email where possible).

- Keep documents, models and drawings to aligned naming conventions set out in the BEP and ISO 19650. Having a consistent naming strategy for documents, models and drawings provides clarity and avoids confusion that may be caused from not aligning to a naming convention.

- Have the ability to host drawings and models online for supervision staff to use mobile devices **(CDE).**

- If you have Total Stations for set out that can integrate 3D BIM models consider prioritising to essential projects if BIM models are available from prefabricated elements.

- Host RFIs using online platform to help manage RFIs more dynamically. Avoid email and static tracker sheets as they only cause delay and confusion **(CDE).**

- On fast paced projects ensure to dedicate a **full time resource BIM Manager/Coordinator** to continually review coordination and interface of different models. On fast paced projects ensure the BIM manager and project manager are doing sanity checks for compliance with Building regulations i.e NZEBS, DAC, FSC.

- Keep solid record of your meetings and coordination issues. Consider hosting on an online platform for easy managing and dynamic tracking **(CDE)**.

- Procurement of Supply Chain and Material protocols may need to be adapted for rapid builds. Check your supply chain as ability to provide i.e import of materials may not be an option. Favour supply chain with better digital and off site capabilities. i.e A Mechanical contractor who is able to coordinate using BIM so ventilation ducting can be fabricated off site in modules.

- Consider hosting your BCAR, Site Inspections, Checklists, Photos on a specialised dedicated platform online using a mobile device for more transparent viewing to wider team (CDE). Provide a dedicated resource for administration of this and a champion of same to site.

Section 4   **Hardware / Software**

As outlined in previous sections above, it is important that organisations firstly identify and establish their internal communication platform so that individual team members can work together and stay connected. Key decision makers within organisations are encouraged to liaise with their IT departments and BIM leads to identify what solutions works best in line with their business structure.

The below table is a non-exhaustive list that identifies software applications used by contractors across the industry today. The majority of these applications include a free trial period where elements can be tested for compatibility within an organisation.

Important note: This is **NOT** a recommended list. This is only a list of software currently in use in the industry today.

Table 2: COMMUNICATION AND COLLABORATION PLATFORMS
ZOOM
GO TO MEETING
GOOGLE HANGOUTS
CISCO WEBEX
MICROSOFT TEAMS
SLACK
LIVESTORM
READYTALK
SKYPE FOR BUSINESS
CLICKMEETING
ANYMEETING

Table 2 – Source: CIF Working Group

In parallel with a communication software platform, it is important that organisations explore options on how to access data and information located on their internal office network. For successfully remote operation, this would be considered essential in order for the team to access existing project folders and documents. There are 2 methods to access data, either through a VPN (Virtual Private Network) and VDI (Virtual Desktop Infrastructure). Again, organisations should meet with their IT representatives and identity what solution best suits their needs, bearing in mind security, costs along with the time required to deploy.

Note that organisations that are already working within a **BIM level 2** environment in collaboration with a larger project team utilising a common data environment (CDE) can still progress with coordination works and BIM development. The items listed above within this section extend the reach of the individual team members and enable full remote working with access to both external and Internal information and Models.

For those working within a **BIM level 1** environment and on projects where a CDE and a BIM Execution Plan has not been defined or established, Organisations should reach out to their current software providers / resellers to discuss options for remote working. Many resellers are offering free solutions to customers impacted by COVID-19 with direct commercial access to cloud based CDEs and collaboration products, including issue tracking / management software. A list of some of the software products solutions that are currently in use within the industry today can be seen in Section 8.2_Table 6, from the BIM Starter Pack, see link:

https://cif.ie/wp-content/uploads/2018/11/BIM-Starter-Pack-LBIC-CIF-ZZ-XX-GD-Z-0003.pdf

Section 5 **Setting up your Workstation at Home**

In light of recent events, many of us are now working from home. For some, this may be the first time you've had to work from home.
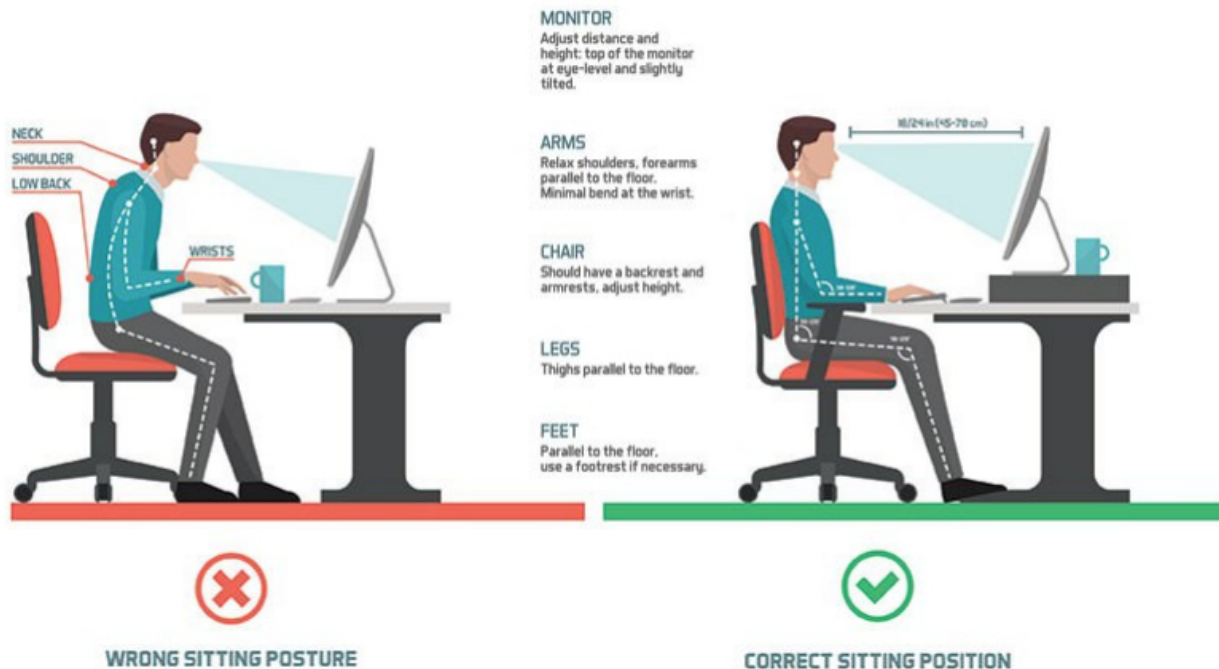
Setting up a workstation at home is different to an office-based setup. Most of us will not have the same level of equipment, office chairs, desks etc.

Your home workstation should be set up as ergonomically as possible so that it's comfortable, it minimises potential risks of musculoskeletal disorders, but also that it's a safe area to work in.

This guide is designed to provide you with some practical tips on how to set up a workstation at home. Although you may be restricted to a kitchen chair and table over the coming weeks there are some simple ways to improve your level of comfort and safety.

We'll briefly look at the following:

▶ **Setting up screen height**

▶ **Working on a laptop**

▶ **Selecting the right chair**

▶ **Selecting the right desk**

▶ **Environmental/safety considerations**

MONITOR
Adjust distance and height: top of the monitor at eye-level and slightly tilted.

ARMS
Relax shoulders, forearms parallel to the floor. Minimal bend at the wrist.

CHAIR
Should have a backrest and armrests, adjust height.

LEGS
Thighs parallel to the floor.

FEET
Parallel to the floor, use a footrest if necessary.

NECK
SHOULDER
LOW BACK
WRISTS

WRONG SITTING POSTURE

CORRECT SITTING POSITION

5.1 Setting up the screen height

It is very important to have your screen height in line with eye level. If you have a separate screen it's a little easier. Unfortunately, many people will be restricted to using the laptop on the kitchen table in the short term.

The average head weighs approximately 4.5kg, but if you tilt the head forward 15 degrees this can increase the loading to 12kg. If we tilt it another 15 degrees forward the load has now risen from 4.5kg to 18kg of load. Not a problem for short periods but if you are working for long periods the accumulation of additional load may cause neck/back strain.

Be mindful of the following, when setting up screen height:

▶ Is my head naturally balanced?

▶ Is my head in line with my spine?

▶ Can I raise my screen height by using books?

▶ Is my screen sturdy/stable?

▶ Elevate laptop screen and push the laptop back further on the desk to allow you to sit with your head more naturally balanced.

▶ If you have a separate keyboard and mouse, then use them. That enables you to sit back into the chair rather than leaning forward.

▶ Try to avoid working on your laptop when sitting on your sofa. Ideally, you don't want to be trying to balance a laptop and type at the same time.

5.2 Selecting the right desk

▶ If you're a regular home worker then you may already have a suitable desk in place. If not, then you may be restricted to a kitchen or dining room table. Kitchen or dining room tables tend to be a little higher than the typical office desk. This additional worksurface height may result in your elbows falling below the desk. This will result in either hunching of the shoulders while working

or pressure on your forearms and wrists. Like when you're at work, try to ensure that, while seated, your workstation allows you to keep your elbows at 90 degree angles, and to relax your shoulders. This will ensure you aren't working in a hunched position or leaning forward to unload onto the table.

▶ If your feet are dangling, you can mimic your office footrest by piling a couple of books on the ground to place your feet on. This will give you greater stability than if your feet are dangling.

▶ If you're used to a sit-stand desk then you could get creative and make your own.

5.3 Environmental/safety considerations

▶ Try to set up your workstation in an area that has good lighting and heating so that it's a comfortable working environment. Appropriate lighting will also minimise potential eye strain.

▶ Avoid, where possible, a set up where your screen is facing the window. This may create glare on your screen.

▶ Ensure your workstation equipment is in good working order. Avoid using damaged chairs, desks etc.

▶ Make sure the floor around you is free of tripping hazards, such as cables, files/folders or kid's toys. We all know how painful stepping on a piece of Lego is!

▶ If you're using an extension cable please be sure that it's in good working condition and not overloaded. Be sure to power down your laptop and turn off plugs when finished working.

▶ Are you taking regular breaks away from your workstation? Make a conscious effort every 30 minutes to leave your workstation, step outside and get some natural air and light.

▶ Try to build some simple stretches into your daily routine, as per next slide. They can be done at your desk or whilst taking breaks away from your desk.

5.4 Stretching exercises

1. Forearm and wrist stretch

▶ Sitting upright, extend arm in front of you.

▶ Using the opposite hand, pull the wrist back until feeling a stretch in the forearm but without feeling any pain.

▶ Hold the position for 20-30 seconds.

2. Shoulder Stretch

▶ Bring one arm up to your chest and support with your other forearm. Pull it across your body toward your chest until you feel a stretch in your shoulder.

▶ Make sure to keep your elbow below shoulder height.

▶ Hold for 20-30 seconds per shoulder.

3. Pec & Chest Stretch

▶ Extend your arms from your sides so forearms are facing away from your body.

▶ Begin to bring your arms back so you feel a stretch in your pectoral muscles.

▶ Relax and breathe, holding the stretch for 15-20 seconds.

4. Overhead Stretch

▶ Standing or sitting upright, gently lift and extend arms straight over head, as far as comfort and range of motion will allow.

▶ Hold for 15/20 seconds.

Section 6 **10 Tips for Working Remotely**

1. Set up a designated workspace.

Separate space for yourself to work in, somewhere you can focus on tasks without being distracted and set up with everything you need for a normal working day – computer, phone, stationery, papers, etc.

2. Make sure you have all the tech you need.

This includes a reliable and secure internet connection, any necessary files, hardware and software, remote access to your company network and, importantly, knowledge of how to get IT support.

3. Get dressed.

Changing into working clothes will help you mentally switch to productive work mode. It will also help you distinguish between 'homeworking' and 'home life'.

4. Write a daily to-do list.

Set out a list of realistic, achievable tasks to keep you focused.

5. Know when to step away from your workstation.

In so far as is possible, try to be clear about when your working day begins and ends. It's easy to let yourself be 'always on' when your home and office are the same place. When work is over, be sure you switch off to avoid burnout.

6. Stay in conversation.

Contribute regularly to team chats/group emails so you don't drop off the radar. Ask about what people are working on and share what's on your schedule. Being physically separated means you miss the 'water-cooler moments' so this is a means to keep informed and stay connected.

7. Foster relationships.

Make time for non-work chats as you would in the workplace and use video calling to maintain face-to-face contact.

8. Be clear in your communication.

Speaking in person gives you visual and audio cues that help you communicate. Conversing remotely removes a lot of that extra information so make your communications especially clear and concise.

9. Ask for support when needed.

Speak out when you need assistance or support. Your manager, colleagues and you are part of a team and should be supporting each other, especially when working remotely.

10. Make remote working work for you.

Change where you sit, put on music, whatever helps you work.

Section 7 **Committee & References**

7.1 Construction 4.0 Sub-Committee

The Construction 4.0 Committee, established in December 2016, is made up of 18 representatives across Civil Engineering, General Construction, Housing, Specialist Contracting and Mechanical & Electrical Engineering. There is also a good regional spread, and a mix of scale of companies.

In order to deliver these objectives, it was determined that technical and strategic representatives would be required, and the Committee should be representative of all regions, sectors and company sizes.

Tim Ferris, Managing Director of O'Shea's Electrical (Jones Engineering Group) is Chairman of the committee **Cillian Kelly**, Head of Digital Project Delivery Ireland / Europe for Sisk is Deputy Chairman, and CIF's Digital Ambassador for Construction.

7.2 References

This Guidance Document is guided by the following CIF BIM standards (which detail all industry standards):

1. **LBIC-CIF-ZZ-XX-GD-Z-0001**
   (BIM Guide Standards & Policies)

2. **LBIC-CIF-ZZ-XX-GD-Z-0002**
   (Bidding for BIM Guide)

3. **LBIC-CIF-ZZ-XX-GD-Z-0003**
   (BIM Starter Pack)

7.3 BIM Working Group

This document has been reserarched and developed by the following individuals:

Table 1 - BIM WORKING GROUP AUTHORS			
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Table 1 - Source: CIF Working Group

Any further CIF members who wish to join the Construction 4.0 Sub-Committee may do so by seeking a nomination from their association.

7.4 GLOSSARY AND DEFINITIONS

BIM	Building Information Modelling
BIM Level 0	In its simplest form, level 0 effectively means no collaboration. 2D BIM drafting only is utilised, mainly for Production Information (RIBA Plan of Work 2013 stage 4). Output and distribution is via paper or electronic prints, or a mixture of both. The majority of the industry is already well ahead of this now (Source: https://www.thenbs.com/knowledge/bim-levels-explained)
BIM Level 1	This is the level at which many organisations are currently operating. This typically comprises a mixture of 3D BIM for concept work, and 2D for drafting of statutory approval documentation and Production Information. BIM standards are managed to BS 1192:2007, and electronic sharing of data is carried out from a common data environment (CDE), often managed by the contractor. Models are not shared between project team members. (Source: https://www.thenbs.com/knowledge/bim-levels-explained)
BIM Level 2	This is distinguished by collaborative working – all parties use their own 3D Building Information Models, but not necessarily working on a single, shared model. The collaboration comes in the form of how the information is exchanged between different parties – and is the crucial aspect of this level. Design information is shared through a common file format, which enables any organisation to be able to combine that data with their own in order to make a federated BIM model, and to carry out interrogative checks on it. Hence any BIM software that each party used must be capable of exporting to one of the common file formats such as IFC (Industry Foundation Class) or COBie (Construction Operations Building Information Exchange). This is the method of working that has been set as a minimum target by the UK government for all work on public-sector work, by 2016. (Source: https://www.thenbs.com/knowledge/bim-levels-explained)
BG 6/2014	BSRIA Design Framework for Building Services 4th Edition
BSRIA	The Building Services Research & Information Association
BRE (UK)	Building Research Establishment

7.4 GLOSSARY AND DEFINITIONS

BSI (UK)	British Standards Institution
CDE	Common Data Environment
CEN	European Committee for Standardisation
CEN/TC	European Committee for Standardisation/Technical Committees
CIC (UK)	Construction Industry Council
COBie	Construction Operations Building Information Exchange
Construction 2020	A Strategy for a Renewed Construction Sector' - Department's Role
Digital Plan of Work (DPoW)	Employers are responsible for defining the deliverables required at each stage of a construction project as a digital plan of work
Facility Management (FM)	FM is the practice of coordinating the physical workplace with the people and work of the organization. It integrates the principles of business administration, architecture and the behavioural and engineering sciences
GSL (UK)	Government Soft Landings
IFC	Industry Foundation Classes
Information Requirements	The information needed to support a project during operations
ISO 19650	Organisation of information about construction works - Information management using building information modelling
Model Production and Delivery Table (MPDT)	Model Production and Delivery Table is a table that outlines who is responsible for developing the BIM model to a specific Level of Detail and Level of Information and at what stage of the project

7.4 GLOSSARY AND DEFINITIONS

National Mirror Committee	National Standards Authority of Ireland, committee to monitor the work of CDE
NBC	National BIM Council
NSAI	National Standards Authority of Ireland
PAS 1192-2:2013	Specification for information management for the capital/delivery phase of construction projects using building information modelling
PAS 1192-3:2014	Specification for information management for the operational phase of assets using building information modelling
POE	Post Occupancy Evaluation
RIAI	Royal Institute of The Architects Of Ireland
RIBA	Royal Institute of British Architects
Soft Landings	Soft Landings is a building delivery process which runs through the project, from inception to completion and beyond, to ensure all decisions made during the project are based on improving operational performance of the building and meeting the client's expectations
See a full list if BIM Terminology on the BRE (UK) Website:	**https://www.bre.co.uk/bim-terminology.jsp**

Table 2 *- Abbreviation List (Source: CIF Working Group)*

Construction
Industry Federation